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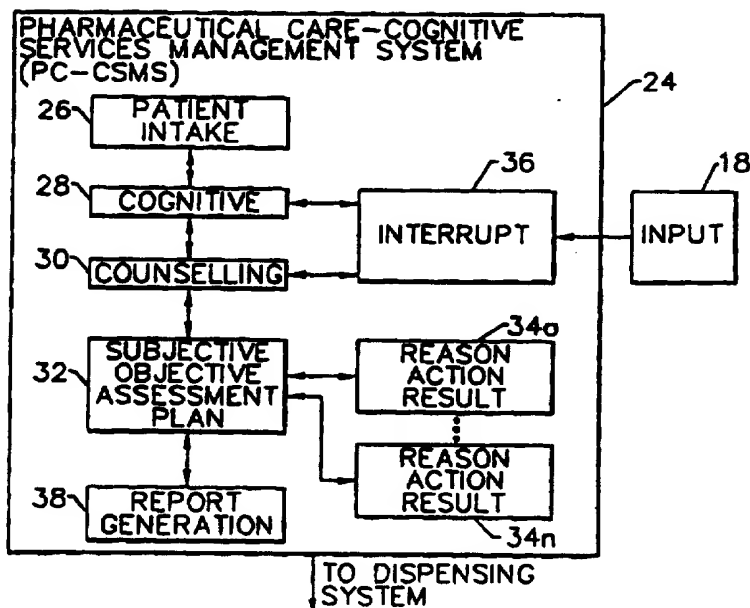
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METHOD

(57) Abstract

A computerized pharmaceutical care cognitive services management system and method (PC-CSMS) (24) allows the transformation of a pharmacist from a vendor to a health care provider. The PC-CSMS (24) captures all of the value added by a pharmacist to a patient encounter and permits the association of multiple RARs (Reason, Action, Result) (34) with a single SOAP (Subjective Information, Objective Information, Assessment, Plan) (32). The PC-CSMS (24) enables the pharmacist to be compensated for each analytical or counseling session (30) and/or service provided to the user associated with a single transaction. The PC-CSMS (24) also enables efficient processing of interruptions (36) to cognitive (28) and counseling (30) sessions. Upon reception of an interrupt (36) from a person or a telephone, the PC-CSMS (24) suspends the cognitive (28) or counseling (30) session for a first patient, processes the interrupt for the second patient and then resumes processing for the first patient.



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FLEXIBLE COMPUTER BASED PHARMACEUTICAL CARE COGNITIVE SERVICES MANAGEMENT SYSTEM AND METHOD

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Field of the Invention

This invention relates to systems and methods used by pharmacists, and more particularly to computer based pharmaceutical care cognitive services management systems which allow a pharmacist to more efficiently
10 conduct an encounter with pharmacy patients.

Background of the Invention

The role of pharmacists is quickly moving from that of a vendor to that of a health care provider. As a result, pharmacists are increasingly
15 concerned about advising patients regarding the selection, use and side effects of over-the-counter and prescription drugs. A pharmacist typically obtains information relating to the patient's history directly from the patient, accepts orders for over-the-counter and prescription drugs, conducts an analysis in terms of a cognitive review of the drug and the patient's history,
20 and conducts a counseling session with the patient during which the pharmacist advises the patient about substitute generic drugs, provides instructions for administering the drug, and advises the patient about possible side effects resulting from use of the drug. Thereafter, the pharmacy dispenses the prescribed drug or an equivalent generic drug.

25 Recently, computer based systems have been introduced to automate this process. Pharmaceutical care systems, typically controlled by a microprocessor, assist a pharmacist in analyzing the impact of drugs with respect to particular patients and to correspondingly provide advice to particular patients based on particular over-the-counter or prescription drugs
30 and specific patient histories. The computer based systems may include a processing unit, a keyboard, a display screen and a printer. These systems assist in the collecting (i.e., intake) of patient history information, conducting of a cognitive analysis, counseling of patients, and dispensing over-the-counter and prescription drugs.

35 One example of a computer based system used by pharmacists is the PharmCare™ system marketed by Pharmaceutical Care Services, Inc. of Waco, Texas. PharmCare™ provides a sequential workflow and is written in

a high level computer language such as Cobol. The PharmCare™ system assists the user with collecting patient information, conducting of cognitive and counseling sessions, and correlating the results of the cognitive and counseling sessions. During cognitive analysis, the PharmCare™ system
5 conducts an automated drug utilization review ("DUR") (also sometimes referred to as drug regimen review ("DRR")) during which an interactive check is made between the over-the-counter or prescribed drug and allergies, pregnancy status, age, and other characteristics and conditions of the patient.

10 During the cognitive phase of the PharmCare™ system, and in particular, during DUR, a pharmacist can create a "SOAP." "SOAP" stands for "Subjective" data, "Objective" data, "Assessment" of data, and "Plan." The subjective data generally refers to any data received that is opinion based while the objective data refers to any data received that is factual
15 based. During the assessment phase, the pharmacist conducts an analysis of the solutions after collecting the data and running the drug review. During planning, the pharmacist determines the action to be taken based on the results of the assessment.

Specifically, the subjective data includes diagnoses, allergies,
20 adverse drug reactions, lifestyle information, problems in general or with drugs, drugs not purchased at the particular pharmacy, over-the-counter drugs presently being taken by the patient, the patient's physicians, the patient's symptoms, and socio-economic considerations. The objective data is a profile of the patient's drug history, and includes data relating to
25 interactions between drugs, interactions between drugs and diseases, interactions between drugs and food, as well as the age and weight of the patient. Additional miscellaneous data is also considered during the SOAP analysis for consistency purposes. The miscellaneous data includes refill frequency dates, nature of over-the-counter drug use, a patient's
30 understanding of particular situations and target goals of the therapy, and a pharmacist's observation of the results of the consultation session with the patient.

During assessment, the pharmacist determines if each of the subjective and objective data are in order and if any problem exists or
35 potential problem exists as a result of the subjective and objective data. For example, a drug incompatibility may exist or the drug prescribed for the

patient may be inconsistent with the patient's lifestyle. Finally, during planning, the pharmacist identifies an action to remove any potential or existing negative results of the drug use, sets target goals, if necessary, and follows up on any previous progress notes.

5 The PharmCare™ system also provides for creation of a RAR (i.e., "Reason," "Action" and "Result"). During a RAR, the pharmacist documents the actual action taken as a result of the interaction between the pharmacist and the patient in order to justify billing the patient or third party payer for the consultation session with the patient. In general, SOAP refers to the clinical
10 portion of the analysis and RAR refers to the billing or financial portion resulting from the analysis. The PharmCare™ system allows the user to associate one RAR with one SOAP.

Unfortunately, the prior art systems do not provide the flexibility necessary in order to fully transform the role of a pharmacist from a drug
15 vendor or dispenser to a health care provider, allowing the pharmacist to recapture the value added by the pharmacist during encounters with patients. For example, the pharmacist may not be able to recapture all of the value added by the pharmacist during the encounter with the patient and subsequently bill the patient or third party payer for the total value added by
20 the pharmacist.

In addition, it is not uncommon for the pharmacist to be interrupted while performing tasks. Prior art systems are indexed, sequential database systems which may require the system to discontinue any analysis being conducted when the interruption is received.

25

Summary of the Invention

It is, therefore, an object of the present invention to provide a flexible computer based pharmaceutical care cognitive services management system.

30 It is another object of the present invention to provide a computer based pharmaceutical care cognitive services management system for capturing all of the value added by a pharmacist to a patient encounter.

These and other objects are provided according to the present invention by a computer based pharmaceutical care cognitive services
35 management system which executes on a computer system. The computer system includes a processor, a data storage device, a display device and an

input device. The computer based pharmaceutical care cognitive services management system comprises a number of subsystems including a patient intake subsystem which includes a patient chart component and a cognitive service record component, a cognitive subsystem, a counseling subsystem, a report generation subsystem, a SOAP (Subjective, Objective, Assessment, Plan) and RAR (Reason, Action, Result) subsystem and an interrupt subsystem.

It is not uncommon for a pharmacist to provide multiple analyses during a single patient encounter and thus add significant value to the encounter with the patient. The present invention allows the pharmacist to recapture the significant value added to the encounter with the patient for each analysis performed by the pharmacist. In particular, the present invention allows a pharmacist to associate multiple billing sessions, i.e., multiple RARs, with one SOAP.

In addition, a pharmacist is often interrupted during a cognitive or counseling session involving a particular patient. Interruptions may include a second patient calling to ask the pharmacist questions about a particular prescription or personally visiting the pharmacist, as well as telephone requests to refill particular prescriptions. The present invention does not require the pharmacist to terminate any cognitive or counseling session being conducted to handle any interruptions and restart the terminated cognitive or counseling session from the beginning after processing of the interruptions. Rather, the pharmaceutical care cognitive services management system and method suspends the interrupted cognitive or counseling session, completes the processing of the interrupt by a patient or a request for a prescription refill, and restarts the suspended cognitive or counseling session from the point of suspension rather than from the beginning. The restart of the suspended session may be automatic or may be enabled by the user.

In particular, the computer based pharmaceutical care cognitive services management system and method prompts the user on the display device to enter identity and history information corresponding to a particular patient using the input device, and stores the identity and history information corresponding to the patient and entered by the user in the data storage device. The pharmaceutical care cognitive services management system also prompts the user on the display device for entry of subjective

information relating to assessed characteristics of the patient and objective information relating to the patient's drug use history, and stores the subjective and objective information entered by the user in the data storage device. The user is also prompted on the display device to enter an
5 assessment of the patient, and also is prompted to enter a plan to follow based on the assessment. The assessment and the plan entered by the user are also stored in the storage device.

The pharmaceutical care cognitive services management system prompts the user on the display device to enter a first reason for the
10 assessment and the plan, a first action in response to the assessment and the plan, and a first result based on the first action. In addition, the pharmaceutical care cognitive services management system prompts the user to enter a second reason for the assessment and the plan, a second action in response to the assessment and the plan, and a second result
15 based on the second action. The first reason, the first action and the first result as well as the second reason, the second action and the second result are stored in the data storage device. Finally, the pharmaceutical care cognitive services management system associates the first reason, the first action and the first result and the second reason, the second action and the
20 second result with the subjective and objective information, the assessment and the plan for the particular patient. As a result, a multiple number of reasons, actions and results are associated with a single stored set of subjective information, objective information, assessment and plan for one patient.

25 The pharmaceutical care cognitive services management system also generates a first billing statement for the patient based on the first reason, first action and first result as well as a second billing statement for the patient based on the second reason, second action and second result. Thus, the pharmaceutical care cognitive services management system generates two
30 billing statements for one patient based on the one set of subjective information, objective information, assessment and plan allowing the pharmacist to recapture all of the value added by the pharmacist during the encounter with the patient.

The pharmaceutical care cognitive services management system also
35 prompts the user on the display device to enter a prescription using the input device, and stores the prescription entered by the user in the data storage

device. The prescription is associated with the patient identity stored in the data storage device, and is compared with the identity and history information corresponding to the patient to produce an indication of possible incompatibilities between the prescription and the patient. The user is also
5 prompted on the display device to enter any changes or alterations to the prescription based on the indications of the possible incompatibilities between the drug and the patient resulting from the comparison between the two. If the user invokes an interrupt during the comparison of the
10 prescription and the patient, or while the prescription is being changed or altered based on any indications of possible incompatibilities between the prescription and the patient, the pharmaceutical care cognitive services management system suspends any prompting of the user to change or alter the prescription and displays information to the user on the display device relating to a second patient. Once processing of the second patient is
15 completed, prompting of the user to change or alter the prescription for the first patient is resumed at the point of suspension.

The user is also prompted on the display device to enter results of a counseling session between the pharmacist and the patient. This process of prompting the user for entry of results of the counseling session is
20 suspended in response to a user interrupt and information concerning a third patient is displayed on the display device. Upon completion of the processing of the third patient, the pharmaceutical care cognitive services management system resumes prompting of the user for entry of the results of the counseling session with the first patient at the point of suspension of the
25 prompting process. These user interrupts may range from merely viewing information relating to the second patient to processing a request by a second patient or a physician to refill a prescription or to fill a new prescription.

In the preferred embodiment, the user may interrupt processing by
30 any of the patient intake, cognitive, counseling, SOAP and RAR or report generation subsystems. In addition, the user may cause the pharmaceutical care cognitive services management system to transfer control from any one subsystem to any other subsystem during use.

35 Brief Description of the Drawings

A preferred form of the invention is illustrated in the accompanying drawings, in which:

FIG. 1 is a high level block diagram of the computer based pharmaceutical care cognitive services management system;

5 FIG. 2 is a block diagram of the pharmaceutical care cognitive services management system referred to in FIG. 1;

FIG. 3 is a flowchart illustrating the operational control of the pharmaceutical care cognitive services management system illustrated in FIG. 2;

10 FIGS. 4A through 4C are conceptual data models for the present invention;

FIGS. 4D through 4H are physical data models for the present invention;

15 FIGS. 5A through 5RR illustrate display screens which are presented to a user and demonstrate the operational logic of the present invention;

FIG. 6 is a flowchart illustrating the operational control of the patient and refill interrupts; and

FIG. 7 is a flowchart illustrating the operational control of the operation of processing a single SOAP and multiple RARs associated therewith.

20

Description of the Preferred Embodiment

25 The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which a preferred embodiment of the invention is shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiment set forth herein; rather, this embodiment is provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout.

Overview: Computer Based Pharmaceutical Care Cognitive Services Management System

35 Referring to Figure 1, a general overview of a computer based pharmaceutical care cognitive services management system 10 will be

described. The system 10 includes a computer system 12 having processor means 14 and pharmaceutical care cognitive services management system ("PC-CSMS") 24. The computer system is connected to data storage means 16. In addition, the computer system 12 is also connected to several
5 input/output peripheral devices including input means 18, display means 20, and printing means 22. Input means 18 may consist of a keyboard, a mouse, a virtual track ball, a light pen, or any other number of devices, individually or collectively used for entering data or selecting options in computing environments. Display means 20 may be a color cathode ray
10 tube, or any other type of display device. Finally, printing means 22 may be a laser printer, or any other type of printing device and may be used for printing patient reports and billing statements.

Preferably, processor means 14 is a personal computer. Data storage means 16 may include hard disk drives, tapes, etc. or any
15 combination thereof. Processor 14 communicates with input device 18, display device 20, printing device 22 and data storage device 16. The computer system also contains pharmaceutical care cognitive services management system or PC-CSMS 24. PC-CSMS 24 communicates with processor 14. PC-CSMS 24 is preferably implemented as a stored
20 program which executes on processor 14.

Referring to Figure 2, a block diagram of pharmaceutical care cognitive services management system or PC-CSMS 24 will now be described. PC-CSMS 24 contains subsystems for patient intake 26, cognitive 28, counseling 30, and SOAP 32 (also referred to as Subjective,
25 Objective, Assessment and Plan). The PC-CSMS according to the present invention also provides multiple RAR subsystems 34 (also known as Reason, Action and Result), an interrupt subsystem 36 and a report generation subsystem 38. The PC-CSMS may be operationally connected to a dispensing system (not shown) for dispensing drugs for a particular
30 patient after conclusion of management of the pharmaceutical process by a pharmacist or user of PC-CSMS 24.

The components of PC-CSMS 24 will now be described generally. A detailed description of these components will be described below in the sections labeled "Detailed Operation." Patient intake subsystem 26 consists
35 of two components (i.e., patient chart and cognitive service record). The patient chart component prompts a user of PC-CSMS 24 to enter via input

device 18, and then stores in data storage device 16, information regarding a patient's identity and history including general information relating to name, residence and demographics, insurance, medical and miscellaneous information. The patient chart component is only implemented for new
5 patients and updating of information for existing patients. The cognitive service record component displays information on display device 20, and prompts a user on the display device to enter, via input device 18, and then stores in data storage device 16, information relating to drug requests permitting a user of PC-CSMS 24 to view and survey work to be done for a
10 patient, additional personal information about a patient specific to the present encounter between the patient and the user of PC-CSMS 24, and a summary of information already known about the patient. The patient chart and cognitive service record components may be used by a technician in addition to being used by a pharmacist.

15 Cognitive subsystem 28 is implemented by PC-CSMS 24 to perform a drug regimen review. During implementation of cognitive subsystem 28, which may be only invoked by a pharmacist, PC-CSMS 24 displays a summary of patient information regarding a particular encounter between a pharmacist and a patient on display device 20, and prompts the user for
20 assignment of patient categories and modules with respect to the patient and the prescribed or over-the-counter drugs. Cognitive subsystem 28 also manages the therapy review of the interactions between the patient and the prescribed or over-the-counter drug and permits the user (i.e., pharmacist) to select alternative medications via input device 18 if problems occur based
25 on the interactions between the drug and the patient. Cognitive subsystem 28 also displays a summary of information known about the patient on display device 20 for easy reference. The patient need not be present during execution of the cognitive subsystem 28.

Counseling subsystem 30 of PC-CSMS 24 brings together the
30 patient, the pharmacist and the drug. During counseling, the patient is physically present with the user of the pharmaceutical care cognitive services management system. Counseling subsystem 30 controls a therapy management session to ensure the patient understands what drug he is getting, the purpose of the drug and the effects of the drug. Counseling
35 subsystem 30 also controls the standard of care by prompting the user on display device 20 to indicate that the various steps in the counseling

session have been completed. Further, counseling subsystem **30** also manages the encounter between the patient and the user by reminding the user of modules and SOAPs not completed. Finally, similar to patient intake subsystem **26** and cognitive subsystem **28**, counseling subsystem **30** also displays a summary of patient information on display device **20** for ease of reference by the user of PC-CSMS **24**.

Report generation subsystem **38** initiates the generation of reports regarding encounters between patients and users of PC-CSMS **24** as well as billing statements and other information and financial reports. Similarly, PC-CSMS **24** may be operationally connected to a dispensing system (not shown) for dispensing the drug prescribed for the patient or the drug alternatively selected by the user of the pharmaceutical care cognitive services management system **24** after completion of counseling subsystem **30**. A number of dispensing systems are presently available including RxExpress marketed by ComCoTech of Chicago, Illinois.

Still referring to Figure 2, SOAP subsystem **32** of PC-CSMS **24** enables the user of PC-CSMS **24** to document the encounter with the patient from a medical perspective. SOAP subsystem **32** controls the collection of subjective or opinion based information relating to the patient, objective or factual based information relating to the patient, entry and storage of an assessment of the relationship between the subjective information and the objective or factual based information, and entry and storage of a plan to be followed which is based on the assessment.

RAR subsystems **34a** through **34n** controls the documentation by the user of the reason for the assessment and plan of SOAP subsystem **32**, the action taken by the user due to the assessment and plan of SOAP subsystem **32**, and the result of the action corresponding to the assessment and plan of SOAP subsystem **32**. RAR subsystem **34** allows the pharmacist to recapture the value added by his encounter with the patient controlled by SOAP subsystem **32**. Multiple RARs **34a** through **34n** can be associated with a single SOAP. Association of multiple RARs **34a** through **34n** with a single SOAP permits the user of PC-CSMS **24** to recapture all of the value added by the user during the encounter with the patient and subsequently generate multiple reports and/or billing statements corresponding to the single encounter with the patient. Multiple RARs can be listed individually as separate entries (i.e., one per line) on a single billing statement. Thus,

multiple RARs associated with a single SOAP allow the user of PC-CSMS 24 to capture the total value added by the user during the encounter with the patient. The number of RARs which can be associated with a single SOAP is essentially unlimited, but in the present embodiment is limited to four.

5 Interrupt subsystem 36 which is invoked externally by the user of PC-CSMS 24 permits the user of PC-CSMS 24 to suspend processing by cognitive subsystem 28 or counseling subsystem 30. The user of PC-CSMS 24 invokes interrupt subsystem 36 via input device 18 upon receiving a telephone call from a patient or a patient interrupting the user in
10 person. Interrupt subsystem 36 controls the review, updating or creation of patient records stored in data storage device 16 as well as processing of requests for refilling a prescription. Upon completion of the review, update or creation of the patient record or entry of the request for refilling of a prescription for a drug, processing of the suspended cognitive or counseling
15 session is resumed and continues until completed.

Pharmaceutical care cognitive services management system 24 also permits a user to tag a note to a particular patient or encounter or to simply remind a user of some task to be completed at a later date. Still further, PC-CSMS 24 also interfaces with one or more drug databases. Moreover, PC-
20 CSMS 24 permits a user to communicate with other users via electronic mail, to access an on-line scheduler or calendar and to access on-line assistance or help.

Finally, since PC-CSMS 24 is implemented in a Windows™ environment, it has a number of common pull-down menus including "File,"
25 "Edit," "Views," "Action," "Reports," "Utilities," and "Help."

Referring to Figure 3, a high level control flowchart of PC-CSMS 24 will now be described. The flowchart in Figure 3 provides the flow control resulting from use of PC-CSMS 24. It will be understood by those having skill in the art that flowcharts may be implemented by computer system 12.
30 PC-CSMS 24 is event controlled, and thus, processing can begin at essentially any of patient intake subsystem 26, cognitive subsystem 28, counseling subsystem 30, SOAP subsystem 32, RAR subsystem 34 or report generation subsystem 38. The following description, however, assumes that processing is begun with patient intake subsystem 26.

35 A determination is made at 50 whether a new patient is to be processed or a patient record is to be updated. If a new patient is to be

entered into PC-CSMS 24 or a patient record is to be updated, patient intake subsystem is invoked at 52 and the new patient information or the updated patient information is collected and stored, i.e., the records are either generated or updated in data storage device 16. If neither a new
5 patient is to be added to PC-CSMS 24 or a patient record is to be updated, a determination is made at 54 as to whether the user is initiating the cognitive subsystem. If the user is initiating the cognitive subsystem, PC-CSMS 24 then proceeds with controlling the cognitive subsystem at 56 by prompting, receiving input, storing the input and displaying encounter review
10 information, standard of care information, therapy review information and patient summary information. If it is determined at 54 that the cognitive subsystem was not invoked by the user, a determination is made at 58 as to whether the counseling subsystem was invoked by the user. If the counseling subsystem was invoked by the user, PC-CSMS 24 then controls
15 the counseling subsystem at 59. As a result, PC-CSMS 24 controls the counseling session by interactively prompting for user entry of information, receiving information entered by the user, storing this information and displaying information to enable therapy management, standard of care, encounter management, and patient summary processes to be performed.

20 If it is determined at 58 that a counseling session was not initiated by the user, a determination is made at 60 as to whether the user has decided to create or update a SOAP (i.e., Subjective, Objective, Assessment and Plan). If it is determined at 60 that the user has initiated a request to create or update a SOAP, PC-CSMS 24 then controls the creation or updating of
25 the SOAP at 62. As a result, PC-CSMS 24 prompts for, receives and stores subjective and objective information relating to the patient and a particular drug, an assessment of the relationship between the subjective and objective information, and a plan to be followed as a result of the generated assessment. Once the SOAP subsystem is completed at 62, a
30 determination is made at 64 as to whether the user requested the creation or update of a RAR (i.e., Reason, Action, Result). If the user requested creation or update of a RAR, PC-CSMS 24 controls the creation or updating of a RAR at 66 by prompting the user and receiving information from the user relating to the reason for the SOAP, an action taken by the user based
35 on the SOAP, and the result of the action. Once the RAR is completed, a determination is made as to whether the user desires to create or update a

second RAR associated with the same SOAP. If so, PC-CSMS 24 creates a second SOAP at 66 associated with the same SOAP as the previously created RAR. Thus, the user may create multiple RARs associated with a single SOAP.

5 If either a determination is made at 60 that a SOAP is not to be created or at 64 that a RAR is not to be created, PC-CSMS 24 makes a determination at 68 as to whether a report is to be generated. If a determination is made at 68 that a report is to be generated, PC-CSMS 24 generates the report at 70. If a report is not to be generated or a report is
10 generated and processing of the report is complete, control is returned to block 50 to determine which of the processes of the pharmaceutical care cognitive services management system 24 are to be invoked. Since PC-CSMS 24 is an event implemented system, it will be understood by those having skill in the art that control can be transferred to any one of the patient
15 intake subsystem 26, cognitive subsystem 28, counseling subsystem 30, SOAP subsystem 32, or report generation subsystem 38 at any point.

 Finally, it will also be understood by those skilled in the art that the interrupt subsystem 36 (see Figure 2) can be implemented at any point during processing by the cognitive subsystem 28 or the counseling
20 subsystem 30.

Conceptual and Physical Data Models

Referring to Figures 4A-4H, the design for the data flow and relationships in the pharmaceutical care cognitive services management
25 system will be described. In particular, conceptual data models for PC-CSMS 24 are illustrated in Figures 4A-4C and physical data models for PC-CSMS 24 are illustrated in Figures 4D-4H. The conceptual data models illustrated in Figures 4A-4C illustrate the entities, attributes, data items, relationships, inheritances and domains according to the pharmaceutical
30 care cognitive services management system. The physical data models illustrated in Figures 4D-4H specify the physical implementation of the database, including tables, columns (primary and foreign keys), indexes, references and referential integrity of the pharmaceutical care cognitive services management system. The graphical technique used to illustrate the
35 design for the conceptual data model and the physical data model will be understood by those skilled in the art. The graphical technique may be

implemented using a design tool referred to as "S-Designor Corporate" which is available from SDP Technologies, Inc. of Westchester, Illinois. The graphical technique for understanding the conceptual data models and physical data models is described in detail in the publicly available
5 Corporate User's Guide, SDP Technologies, Inc., 1993, Part 1, pages 11-33, the disclosure of which is hereby incorporated herein by reference.

**Detailed Operation of Pharmaceutical Care
Cognitive Services Management System**

10 The sequence of operations performed by the pharmaceutical care cognitive services management system will now be described in detail with reference to screen interfaces illustrated in Figures 5A-5RR. In addition, the flowcharts in Figures 6 and 7 provide the flow control resulting from
15 implementation of multiple RARs associated with a single SOAP and the patient and refill interrupt subsystems, respectively. It will be understood by those having skill in the art that the screen interfaces of Figures 5A-5RR illustrate the operational control flow of the PC-CSMS 24 which is
20 implemented using event programming techniques rather than sequential programming. It will also be understood by those having skill in the art that the operational flow defined by the screen interfaces and their sequence, may be implemented by computer system 12, operating under stored
program control. The displays illustrated in Figures 5A-5RR are examples of displays which appear on display device 20 at various times during use of
25 the PC-CSMS 24. Selection of options displayed on display device 20 may be made by a user using any input device including a keyboard, a mouse, a virtual track ball, a light pen or even a touch screen interface, individually or collectively. The system responds according to the selection made by the user.

Generally, during use of PC-CSMS 24, a user can implement any of
30 the subsystems from any point. For example, while in the patient intake subsystem (i.e., patient chart or cognitive service record), a user may decide to terminate processing by the patient intake subsystem and begin processing by the cognitive subsystem or counseling subsystem. Operational flow of the pharmaceutical care cognitive services management
35 system will now be described with reference to Figure 5A-5RR.

Detailed Operation: Work Order Subsystem

Referring to Figure 5A, the list of work orders to be processed by the user or pharmacist is displayed. The list of work orders, which is always the first screen interface to be displayed to the user, may be accessed at any point during use of PC-CSMS by selecting the "WO" key or button 101 on the display screen. "Keys" may also be referred to as "buttons." The list of work orders displays all active orders in the system. A variety of information is displayed with respect to each patient including the status of the prescription (e.g., waiting, pick up or delivery), the name of the patient, the status of the processing of the drug order (e.g., in process ("IP") or suspended ("S")), the step of the pharmacy management or health care being provided (e.g., "Cognitive," "Counseling" or "Reporting"), and the category of the patient (e.g., "Low" which means a basically healthy person, "High" which means a patient has some problems which may be chronic, or "Special" which refers to anything that the user wants to specifically note). Additional information is also displayed with respect to each patient in the list of work orders including the number of prescriptions to be filled, how many, if any, of the prescriptions to be filled are new prescriptions, what type of patient requests are to be performed, the number of modules and module steps to be performed, and the cognitive service record number of the current patient encounter.

Still further, different views may be displayed of the work order. Options for displaying different views of the work order are displayed at 121 which permit the user to display all orders, orders being dispensed, orders presently being processed by the cognitive subsystem, or orders which require processing by the counseling subsystem. Finally, the user can find a patient quickly by entering a user's name in the "Find Patient" field and the PC-CSMS will locate the patient in the list of the patients presently being viewed, highlight the patient located in the list of patients, and provide additional personal information relating to the patient at 122.

As previously mentioned, after the work order is viewed and a patient is selected, the user may move to any of the other subsystems of PC-CSMS by selecting any of the other keys or buttons on the display screen, including the patient chart ("PC") at 102, cognitive service record ("CSR") at 103, cognitive subsystem ("COG") at 104, counseling subsystem ("COU") at 105, patient interrupt subsystem ("Pt.") at 106, refill interrupt subsystem ("Refill")

at 107, SOAP subsystem at 108, Note subsystem at 109 or Mono (i.e., Drug Monograph) subsystem at 110. The user may also use electronic mail by selecting the "Mail" key or button at 111, use the scheduler by selecting the "Sched" key or button at 112 or use on-line assistance by selecting the
5 "Help" key or button at 113.

Detailed Operation: Patient Intake Subsystem

The detailed operation of the patient intake subsystem will now be described. The patient intake subsystem includes two components, i.e.,
10 patient chart and cognitive service record. The patient chart component is generally only accessed by the user if a new patient is to be processed, and thus patient identification and history information must be entered into PC-CSMS, or if the patient identification and history information relating to a particular patient requires updating.

15 Referring to Figures 5B-5G, the patient chart component includes six "tabs" (at 125, generally) or parts relating to general patient identification information, insurance, medical history, miscellaneous, drug profile information, and CSR (i.e., Cognitive Service Record) history information. The user may move between any "tab" or part by "clicking" on the desired
20 tab or using any other input device for selecting options. While in the general mode for patient chart as illustrated in Figure 5B, the user is prompted on display device 20 to enter general information relating to the new patient including name, social security number, address, telephone numbers, demographics, the preferred language of the patient, an assigned
25 patient identification number and so forth. The information is entered at input device 18 by the user. In some cases, PC-CSMS 24 provides the user with a list of information from which to choose or select data by selecting the "_" key adjacent to the particular category. For example, "_" at
30 130 adjacent to the "Race" field will display a list of different races from which the user can select. Similar "_" keys are adjacent to the "Gender" field as well as the "Preferred Language" field indicating that the user can select the gender and preferred language from a predefined list.

Referring to Figure 5C, the user is prompted to enter information relating to the patient's insurance by displaying a screen similar to that
35 illustrated in Figure 5C on display device 20. As will be understood by those skilled in the art, a payer and information related to a patient's

insurance for the particular payer, can be added by selecting "Add" key or button **141** to add a payer to the list of patient payers. Information which may now be entered by the user at input device **18** relating to the patient's insurance for the particular payer includes the patient's relationship to the card holder, identification of the card holder, the patient's insurance number, plan, group, and eligibility details relating to family, individual and policy effective date. The user may find the card holder by selecting "Find" key or button **140** which allows the user to find the particular card holder by displaying the current card holders for this particular payer. In addition, any payer and related patient insurance information for the particular payer may be removed by highlighting the particular payer in the list of patient payers and selecting "Remove" key or button **142**.

The user is also prompted during patient chart to collect or update information relating to the medical history of the patient by displaying a screen similar to that illustrated in Figure 5D. Any number of different characteristics may be displayed and collected relating to a patient. For example, information relating to drug allergies, skin rash, difficulty breathing, stomach irritation, shock, anemia, medical conditions, blood type or impairments may be noted. In addition, the patient's physician or prescriber may be listed and names of physicians or prescribers may be added to or deleted from the "prescriber" list using "Add" key **145** or "Remove" key **146**, respectively. As indicated by the "_" and "_" keys, the drug allergies and the medical conditions may be selected by scrolling a predefined list scrolled to locate an allergy or condition located in the list.

PC-CSMS **24** also prompts the user to enter or update miscellaneous information with respect to the patient. This is accomplished by displaying a screen similar to that illustrated in Figure 5E on display device **20** for the "Misc." tab at **125**, generally, permitting the user to enter the various miscellaneous information or select the information from a predefined list. For example, miscellaneous information may include child resistant packaging, generic drugs, size of the label for ease of reading, medication selection priority, preferred therapy, pharmacist observations regarding characteristics of the patient, alcohol use, tobacco use and whether corrective lenses are used. Information relating to alcohol use and tobacco use may be selected from predefined lists as indicated by the "_" keys.

Referring to Figure 5F, patient chart also displays information to the user on display device 20 relating to the patient's prescription profile ("Rx Profile"). The information displayed to the user may include the date of a prescription, the prescription number, the name of the drug, the quantity of units of the drug, the number of refills permitted, the identification of the prescriber, and various other information relating to the profile of a particular prescription.

Finally, a patient chart also displays the cognitive service record history of the patient ("CSR History") by displaying a screen similar to that illustrated in Figure 5G. The information displayed to the user permits the user to enter via display device 20 the date a cognitive service record was created, and allows the user to enter or view different sections of cognitive services records including information relating to the patient's health, summary of drug use, interventions, requests and screenings.

The second component of the patient intake subsystem is cognitive service record ("CSR"). Cognitive service record may be invoked by selecting "CSR" key or button 103. Referring to Figures 5H-5J, processing of the cognitive service record component will be described. Cognitive service records, as indicated by the tabs "Requests," "Encounter Info" and "Pt. Summary" at 181, generally, permit handling of requests, collection of encounter information and displaying of a summary of information relating to the patient. During requests, the user can view and survey the work to be performed with respect to a particular patient. For example, the delivery status of a drug is displayed in Figure 5H in terms of whether the patient is waiting for the drug, the patient is going to pick up the filled prescription, or the filled prescription is to be delivered to the patient. In addition, information relating to current prescriptions is listed, and the user may add a prescription by selecting "New Rx" key 182, may edit a current prescription by selecting "Edit" key 183, or remove a current prescription by selecting "Remove" key 184. A list of previous prescriptions is also displayed to the user and the user may search this list for a particular drug by name or prescription number. In addition, the user may refill a prescription by highlighting the prescription to be refilled in the list of previous prescriptions and selecting "Refill" key 185. During processing of requests, the user can also enter over-the-counter consultation requests and extended consultation

requests. Finally, the user may also enter screening requests by the patient which can be selected by the user from a predefined list.

Upon completing processing of the request portion of the cognitive service record component of the patient subsystem, the user may select
5 encounter information processing by "clicking" on the "Encounter Info" tab at **181**, generally. It will be understood by those having skill in the art that the user can move to any one of the processes within the cognitive service record component by clicking on any of the tabs "Requests," "Encounter Info" or "Pt. Summary" at any time during processing of the cognitive service
10 record component. Similarly, the user can move to any one of the processes or tabs within each major subsystem (e.g., patient chart subsystem, counseling subsystem, etc.) by clicking on any of the tabs displayed during processing of the subsystem.

Referring to Figure 5I, processing of the encounter information with
15 respect to the cognitive service record component will now be described. During encounter information processing, the pharmaceutical care cognitive services management system collects any additional information relating to the patient which is specific to the present encounter with the patient. For example, other prescriptions are listed. In addition, prescriptions may be
20 added to or removed from this list by selecting the "Add" option or the "Remove" option at **191** or **192**, respectively. Still further, the user can enter any obstetrics information, any specific problems reported by the patient, and any current over-the-counter medications being taken by the patient. Finally, the patient's physicians are listed, and the user can add physicians
25 to this list or remove physicians from this list by selecting the "Add" option or the "Remove" option at **193** or **194**, respectively. This list can be scrolled to permit the user to review any particular physician.

Finally, PC-CSMS displays a patient summary similar to that illustrated in Figure 5J on display device **20** upon selection of the "Pt.
30 Summary" tab at **181**, generally. The patient summary displayed to the user displays basic patient information collected during patient chart and cognitive service record components of the patient intake subsystem, as well as a list of the patient's physicians, allergies and medical conditions. This patient summary gives the pharmacist a quick summary of the patient
35 information and ready access to important information already requested by PC-CSMS, entered by the user and stored by PC-CSMS.

Detailed Operation: Cognitive Processing Subsystem

Referring to Figures 5K-5N, the cognitive subsystem will now be described in detail. Similar to the patient chart and cognitive service report components of the patient intake subsystem, the cognitive subsystem may be invoked by selecting the "COG" key 104. Generally, PC-CSMS 24 processes the drug regimen prior to using the cognitive subsystem. A DUR is performed in order to determine if there is anything unique about this drug, this particular patient, the particular disease, the quantities of the drug and so forth which may result in an adverse reaction of the patient to the drug. The patient does not need to be present during processing by the cognitive subsystem. Part of DUR is automatic in that PC-CSMS 24 compares the identified drug with the information in a drug database to identify side effects of the drug and any interactions that may occur as a result of this particular patient using the identified drug. The result of the comparison is utilized during the therapy review portion of cognitive processing. While the patient intake subsystem (i.e., patient chart and cognitive service record) may be used by a technician, the user of PC-CSMS during cognitive processing must be a pharmacist. Generally, the cognitive subsystem has four parts as indicated by the four tabs generally at 211 in Figures 5K-5N (i.e., "Encounter Review", "Standard of Care", "Therapy Review" and "Pt. Summary"). Encounter review, standard of care, therapy review or patient summary may be invoked by the user at any time during cognitive processing by selecting one of the tabs at 211.

During encounter review, PC-CSMS 24 displays a summary of information relating to the particular encounter with the particular patient on display device 20. An example of the information displayed during encounter review is illustrated in Figure 5K. The information displayed is reformulated for purposes of the encounter review from information previously requested by PC-CSMS and entered by the user. For example, during encounter review, drug requests are displayed, and notes relating to the encounter may be entered by the user and/or displayed. In addition, any over-the-counter consultation requests, extended consultation requests, screening requests, other prescriptions, over-the-counter drugs, and reported problems may be displayed.

If the "Standard of Care" tab is selected during cognitive processing, PC-CSMS displays a "Standard of Care" screen similar to that illustrated in Figure 5L prompting the user to categorize the current patient and to assign patient "modules" to the patient. The user can select the category from a list of options including "Low," "High" and "Special" as indicated by the "_" key adjacent the "Category" field. A patient categorized as "Low" is a basically healthy person. A patient categorized as "High" has some problems which may be chronic. In other words, the patient may have some condition that requires monitoring such as diabetes, hyperactiveness or a serious illness. Finally, the "Special" category refers to anything that the user (i.e., pharmacist) wants to specifically note such as obesity. A description of the category is also displayed. In addition, during standard of care processing, a module list is displayed from which the user may select modules to be assigned to the patient. Modules are added or assigned to a patient using "Add" key 222 in which case the modules are added to the list. Modules may be removed from the list of modules assigned to the patient by using "Remove" key 223. In addition, medical conditions, allergies and current drugs are also displayed.

If the user decides to conduct the "Therapy Review" by selecting the appropriate tab at 211, generally, the pharmaceutical care cognitive services management system interactively prompts the user to indicate therapy goals for the user as well as to make any necessary alterations to the prescribed drug. In essence, the therapy review portion of the cognitive subsystem is where PC-CSMS displays the results of the automated portion of the drug utilization review and allows the pharmacist to review these results and make any necessary changes.

Referring to Figure 5M, the drugs prescribed and to be reviewed by the pharmacist are displayed on display device 20. The list of drugs includes not only the prescription number, the drug, the form of the drug (e.g., tablet), as well as the quantity of each unit, but also an indication as to whether the pharmacist has completed the therapy review for each particular drug. If the therapy review has been completed, "Done" is listed adjacent to the drug. Problem categories are also listed during therapy review. The problem categories indicate any potential problems which may arise from interactions between drugs, interactions between drugs and food, the lifestyle of the patient, interactions between drugs and allergies, interactions

between drugs and diseases, the particular patient or the particular patient's compliance with the prescription and proposed drug therapy. If the automated portion of the DUR determines that a possible problem could occur, it is "flagged" adjacent the category in the listing of problem categories. In addition, the pharmacist must complete the analysis of the problem category.

In addition, during therapy review, prescription information is listed in the form of identification of the drug, quantity, and the days the drug is to be taken. The physician's name (e.g., Flores, H.J.), and instructions for taking the medication also are displayed. During therapy review, PC-CSMS requires the pharmacist to conduct a SOAP for each flagged problem category. If two problems are flagged in any problem category, a separate SOAP must be conducted for each flag. An indication of the SOAPS conducted may be displayed on display device 20. The SOAP must be created by the pharmacist before PC-CSMS will indicate that the problem category analysis is "Done" and that the therapy review for the drug is "Done." The SOAP subsystem will be described below with respect to Figures 5W-5X, 5CC-5EE and 7. Finally, the pharmacist may enter a goal for the therapy. This is simply an indication of the purpose of taking the drug.

Finally, by selecting the "Pt. Summary" tab at 211, generally, the user may review a summary of patient information during the processing by the cognitive subsystem. If this tab is selected, a summary of patient information is displayed similar to that illustrated in Figure 5N. The information, as discussed before with respect to patient summary during cognitive service record processing, includes basic patient information, and listings of the patient's physicians, allergies and medical conditions.

The pharmaceutical care cognitive services management system requires the pharmacist to at least view all phases of the cognitive analysis during cognitive processing. As a result, PC-CSMS will not exit cognitive processing until everything in therapy review has at least been reviewed by the pharmacist. The only exception to this is if cognitive processing is suspended by the patient or refill interrupt which will be described below. If the cognitive processing is suspended, it is resumed after completion of the patient or refill interrupt.

35

Detailed Operation: Counseling Subsystem

Referring to Figures 5O-5R, processing of the counseling subsystem will now be described in detail. Similar to the patient intake subsystem (i.e., patient chart and cognitive service report) and the cognitive subsystem, the counseling subsystem may be invoked by selecting the "COU" key 105.

5 Generally, PC-CSMS 24 brings the patient, the pharmacist and the prescription together at the same time to complete the encounter with the patient during counseling processing. Requests noted during cognitive service record processing will be completed during counseling processing. The patient must be present during the counseling session in order to allow
10 the user (i.e., pharmacist) of PC-CSMS 24 to complete the encounter with the patient. Similar to the cognitive subsystem, the user of the counseling subsystem must be a pharmacist. Generally, the counseling subsystem has four parts including "Therapy Management", "Standard of Care", "Encounter Management" and "Patient Summary". Therapy management, standard of
15 care, encounter management or patient summary may be invoked by the user at any time during counseling processing by selecting the appropriate tab at 251.

During therapy management, PC-CSMS 24 interactively prompts the pharmacist through the counseling session with the patient so that the
20 patient understands what drug he is receiving, understands the purpose for the drug, and understands what the drug will do for him. Referring to Figure 5O, PC-CSMS 24 displays a list of the drugs prescribed for the patient including the prescription number and the identification of the drug. In addition, as illustrated in Figure 5O the therapy management for a particular
25 drug is noted as having been completed by the inclusion of "Done" next to the drug. Information previously received by PC-CSMS 24 with respect to the highlighted drug is also displayed, including the drug name, the form of the drug, the size of the unit dosage, the number of units of the drug, the number of days the drug is to be administered, and the prescribing
30 physician's name. In addition, instructions for taking the drug as well as the therapy goal are also displayed. Finally, the therapy goal, if completed during processing by the cognitive subsystem, will be displayed. Otherwise, the pharmacist can complete this field during therapy management.

Also during therapy management, the pharmacist using PC-CSMS
35 will advise the patient with respect to the drug, how the drug helps the disease, how to properly take the drug, what to avoid taking while on the

drug, what, if any, follow-up is necessary, and so forth. As the user of PC-CSMS completes each portion of this counseling session, the user must indicate that each portion has been discussed with the patient and completed by making an appropriate indication on the screen as illustrated in Figure 5O. Still further, the pharmacist makes an observation with respect to the commitment of the patient to the drug therapy and records the results of the observation. Finally, the pharmacist enters any questions the patient may have with respect to the drug or the proposed therapy. Patients' questions are processed by PC-CSMS 24 as SOAPs. As a result, a SOAP is created for each question listed. The SOAP subsystem will be discussed below with respect to Figures 5W-5X, 5CC-5EE and 7.

If the "Standard of Care" tab is selected during counseling processing, PC-CSMS 24 displays any modules assigned to the patient on display device 20 as illustrated in Figure 5P. If any modules were assigned to the patient during processing by the cognitive subsystem, the steps to be performed for each module will also be displayed on display device 20. PC-CSMS 24 processes these steps interactively by requiring the pharmacist to indicate that each step listed has been completed, and if testing is needed, prompts the pharmacist to record the results of the testing such as the results of taking the patient's blood pressure.

If the "Encounter Mgmt" tab at 251, generally, is selected during counseling processing, PC-CSMS 24 identifies tasks to be completed for this encounter with this particular patient. The tasks to be completed may include module steps not completed during the standard of care procedure for counseling, SOAPs not completed, and notes previously generated by the pharmacist or a technician that requires some action. Thus, PC-CSMS 24 keeps track of modules, SOAPs and notes so that all modules, SOAPs and notes have been completed or addressed prior to completing processing by the counseling subsystem for the patient.

During encounter management, PC-CSMS displays a list of incomplete items which need to be addressed by the pharmacist and a list of completed items previously addressed by the pharmacist on display device 20 as illustrated in Figure 5Q. In addition, PC-CSMS displays item types which allows a listing of incomplete items to be subset into types such as "SOAPs", "Follow-ups" or "Procedures".

Finally, in response to selection of the "Pt. Summary" tab at 251, generally, during counseling processing, a summary of patient information similar to that displayed by PC-CSMS during processing of the cognitive service record and by the cognitive subsystem is displayed on display
5 device 20 as illustrated in Figure 5R. The information displayed includes basic patient information and listings of the patient's physicians, allergies, and medical conditions.

10 Detailed Operation: Report Generation
Subsystem and Dispensing

Pharmaceutical care cognitive services management system 24 also generates reports which may be given to the patient and which may be maintained by the pharmacist or sent to the physician. The reports
15 summarize the encounter. These reports may include health related reports as well as billing statements for the counseling provided by the patient. Various types of billing statements may be generated including a standard CSR report, a NARD report which allows a pharmacist to bill for cognitive services, and a HCFA 1500 report which is used in association with health
20 care paid for by government agencies. Multiple bills for services may be included as separate line entries on a single billing statement. The user of PC-CSMS 24 may initiate the generation of various reports by selecting a "Report" key (not shown).

PC-CSMS 24 may also be connected to a dispensing system (not
25 shown) used for dispensing the identified drug. Dispensing may be done at the same time as the cognitive session, but is typically completed prior to the counseling session.

30 Detailed Operation: Patient and Refill
Interrupt Subsystems

As previously discussed, PC-CSMS 24 allows the user to suspend processing by the cognitive subsystem or the counseling subsystem by invoking a patient interrupt or a refill interrupt. If the patient interrupt or refill
35 interrupt are invoked, and PC-CSMS is presently processing cognitive or counseling sessions, PC-CSMS 24 suspends the cognitive or counseling session, processes the patient or refill interrupt, and, upon completion of processing of the patient or refill interrupt, resumes processing of the

suspended cognitive or counseling session. The detailed operation of the patient interrupt will be described below. Detailed operation of the refill interrupt will be described thereafter.

Referring to Figures 5S, 5T and 6, the patient interrupt subsystem will now be described in detail. Similar to the other operations available to the user of PC-CSMS, processing by the patient interrupt subsystem may be invoked by selecting the "Pt." key 106. Generally, in response to a user invoking the patient interrupt subsystem, PC-CSMS 24 will give the user the option of suspending processing by the cognitive or counseling subsystem, or canceling the interrupt and continuing processing by the cognitive or counseling subsystem. If the user invokes the patient interrupt subsystem and PC-CSMS 24 is in the cognitive processing state, PC-CSMS 24 prompts the user by displaying a screen similar to that illustrated in Figure 5S to select whether the user wants to suspend the cognitive processing and resume it at a later time, cancel the interrupt and continue the current cognitive processing session, or seek on-line assistance (i.e., help). Similarly, if the user selects the patient interrupt subsystem and PC-CSMS 24 is in the counseling processing state, PC-CSMS prompts the user by displaying a screen similar to that illustrated in Figure 5T on display device 20 to either suspend the current counseling session and resume it at a later time, cancel the interrupt and continue the current counseling session or seek on-line help.

Whether PC-CSMS is executing in the cognitive subsystem, counseling subsystem or some other processing state, PC-CSMS will prompt the user to either select a patient, intake a patient, add a new patient or cancel the patient interrupt by displaying a screen similar to that illustrated in Figure 5U on display device 20 upon selection of the "Pt." key 106. During processing by the patient interrupt subsystem, fields for entry of the "Last Name" and "First Name" of a patient, and a listing of patients are displayed on display device 20. The listing of patients may be scrolled to locate a patient either alphabetically before or after those displayed in the window illustrated in Figure 5U. In addition, options for processing a patient interrupt are provided to the user through the use of keys or buttons 291-296. In particular, the user may select the "Pt. Chart" key 291 to view or update the patient chart of the interrupting patient, "Pt. Requests" key 292 to take in information from the patient, fill a new prescription, refill an existing

prescription or to document reasons for the patient's call, "New Pt." key 293 to create a patient chart for a new patient, or "Cancel" key 294 to terminate the patient interrupt and return to the processing from which the patient interrupt was invoked. The user may also select the "Help" key 295 to seek on-line help provided by PC-CSMS or the "Search" key 296 to search for the patient name entered by the user. "Pt. Chart" key 291 and "Pt. Requests" key 292 are only enabled for a valid patient name entered in the Last Name and First Name fields or selected from the list of patients. "New Pt." key 293 is enabled whether or not a valid patient name is entered.

Generally, if the patient for whom the patient interrupt subsystem was invoked is listed in the list of names, the user may scroll the list of names until the interrupting patient is located within the list. Similarly, the user may enter the patient's last name followed by the first name in the appropriate fields and PC-CSMS will automatically scroll the list of patient names to locate the name of the patient entered by the user upon the user's selection of the "Search" key 296. If "Pt. Chart" key 291 is selected, the patient chart for the interrupting patient is retrieved and the patient chart component of the patient intake subsystem previously described is initiated to allow the user to review or update the patient chart for the interrupting patient. If the "Pt. Requests" key 292 is selected by the user, PC-CSMS 24 initiates the cognitive service record component of the patient intake subsystem for the interrupting patient identified in the list of patient names. The cognitive service record processing was previously described above. If the "New Pt." key 293 is selected by the user, PC-CSMS transfers control to the patient chart component of the patient intake subsystem which was previously described to allow the user to create a patient chart for a new patient. Finally, if the "Cancel" key 294 is selected by the user, processing by the patient interrupt subsystem is terminated and control is returned to the calling process.

If the patient interrupt subsystem was invoked during either cognitive or counseling processing, PC-CSMS resumes processing of the suspended cognitive process or the suspended counseling process, respectively, upon completion of processing by the patient interrupt subsystem.

Upon selection of "Refill" key 107, PC-CSMS invokes the refill interrupt subsystem. Similar to the patient interrupt subsystem, PC-CSMS will suspend the current processing by the cognitive subsystem or

counseling subsystem if PC-CSMS is processing a cognitive session or a counseling session at the time the refill interrupt subsystem is invoked by the user. PC-CSMS 24 will prompt the user to decide whether to suspend the current cognitive or counseling sessions and resume processing of the
5 respective session upon completion of the refill interrupt processing, or to cancel the interrupt and continue the current cognitive or counseling session. The system prompts the user to make this decision and selection by displaying screens similar to those illustrated in Figures 5S or 5T on display device 20. If the refill interrupt subsystem was invoked while PC-
10 CSMS 24 was processing any procedure other than a cognitive session or counseling session, PC-CSMS simply terminates those other sessions.

Upon selection of the refill interrupt, PC-CSMS displays a screen similar to that illustrated in Figure 5V on display device 20 which provides a field (i.e., "Rx #") for the user to enter the prescription number of the drug to
15 be refilled. In addition, the system also displays information corresponding to the particular prescription number and provides the user with the options of initiating a refill procedure by selecting the "Refill" key 301, finding a patient by selecting the "Find Pt." key 302, canceling processing by the refill interrupt subsystem by selecting the "Cancel" key 303 or asking the system
20 for on-line help by selecting the "Help" key 304. "Refill" key 301 is only enabled if it is determined that a valid prescription number was entered in the "Rx #" field.

Upon the user's entry of the number of the prescription to be refilled, PC-CSMS 24 makes the determination as to whether the prescription
25 number is a legitimate number. If the prescription number is a legitimate number and the user selects "Refill" key 301, control is transferred to processing of the cognitive service record for the entered prescription number. If the prescription number entered by the user is legitimate and the user selects the "Find Pt." key 302, control is transferred to the patient
30 processing and the patient intake screen similar to that illustrated in Figure 5U is displayed on display device 20 to allow the user to locate the patient for the particular prescription. The system will automatically highlight the name of the patient in the list of patient names of Figure 5U which corresponds to the prescription number entered by the user during
35 processing by the refill interrupt subsystem. If the "Cancel" key 303 is selected, processing by the refill interrupt subsystem is terminated whether

or not the prescription number is legitimate. If the "Help" key 304 is selected, control is transferred to help menus to allow the user to access on-line assistance.

5 If a determination is made that the prescription number entered by the user is not legitimate, the "Refill" key 301 will be inactive. However, the user may select the "Find Pt." key 302, the "Cancel" key 303 or the "Help" key 304. The only difference in the processing is if the "Find Pt." key 302 is selected, control is transferred to patient processing and the patient intake screen similar to that illustrated in Figure 5U is displayed on display device 10 20, but no patient name will be highlighted corresponding to the prescription number since the prescription number was not legitimate.

Finally, upon completion of the processing by the refill interrupt subsystem, a determination is made as to whether control by the patient interrupt subsystem was received from either a suspended cognitive session 15 or a suspended counseling session. If the refill interrupt subsystem was invoked during either cognitive or counseling processing, PC-CSMS allows the user to resume processing of the suspended cognitive process or the suspended counseling process, respectively, upon completion of processing by the refill interrupt subsystem.

20 Referring to Figure 6, a high level flowchart of the processing by the patient and refill interrupt subsystems 36 is illustrated. The high level control of the patient and refill interrupt subsystems will now be described. A determination is made at 310 as to whether the patient interrupt subsystem was invoked. If the patient interrupt subsystem was invoked, a determination 25 is made at 311 as to whether the system is currently processing a cognitive session for a first patient. If it is determined at 311 that the system is currently processing a cognitive session for a first patient, the cognitive session for the first patient is suspended at 312 and the patient interrupt for the second patient is processed at 313. Upon completion of the processing 30 of the interrupt for the second patient, control is returned to the suspended cognitive session for the first patient and processing of that cognitive session is resumed at 314.

If it is determined at 311 that cognitive processing for a first patient is not currently being performed, a determination is made at 315 as to whether 35 the system is presently processing a counseling session for a first patient. If it is determined at 315 that the system is presently processing a counseling

session for a first patient, processing of the counseling session for the first patient is suspended at **316** and control is transferred to patient processing for processing the interrupt for the second patient at **317**. Upon completion of the processing for the second patient at **317**, control is returned to the
5 suspended counseling session and processing of the suspended counseling session for the first patient is resumed at **318**. If it is determined at **315** that a counseling session for the first patient is not presently being processed, then the current session (e.g., patient intake, cognitive service record, etc.) is terminated and the control is transferred to patient processing
10 to process the interrupt for the second patient at **319**.

If it is determined at **310** that the patient interrupt was not selected, a determination is made at **320** as to whether the refill interrupt was selected. If the refill interrupt was selected, a determination is made at **321** as to
15 whether the system is presently processing a cognitive session for a first patient. If the cognitive session for a first patient is being processed, this cognitive session for the first patient is suspended at **322** and the refill interrupt for the second patient is processed at **323**. Upon completion of the processing of the refill interrupt for the second patient, control is returned to the suspended cognitive session for the first patient, and processing of the
20 suspended cognitive session for the first patient is resumed at **324**.

If it is determined at **321** that a cognitive session for a first patient is not being processed, a determination is made at **325** as to whether a counseling session for a first patient is being processed. If a counseling session for the first patient is being processed, the counseling session for
25 the first patient is suspended at **326** and the refill interrupt for the second patient is processed at **327**. Upon completion of the processing of the refill interrupt for the second patient at **327**, control is returned to the suspended counseling session and the processing of the suspended counseling session is resumed at **328**.

30 If it is determined at **325** that a counseling session for a first patient is not presently being processed, the current session (e.g., patient intake, cognitive service record, etc.) is terminated and the refill interrupt is processed at **329**.

35 Finally, if it is determined at **320** that the refill interrupt was not selected by the user, a determination is made at **330** as to whether any of the other interrupts were selected. If any of the other interrupts was selected,

the current session is terminated and the other interrupt is processed at 331. If it is determined at 330 that none of the other interrupts was selected, the current session continues to be processed until either a different session is selected or one of the interrupts is selected.

5

Detailed Operation: SOAP/RAR Subsystems

Referring to Figures 5W-5X and 7, the SOAP (Subjective, Objective, Assessment and Plan) subsystem and the RAR (Reason, Action, Result) subsystem will now be described in detail. Similar to the patient and refill interrupt subsystems, the SOAP subsystem may be invoked at any time during use of the pharmaceutical care cognitive services management system. However, unlike the patient and refill interrupt subsystems, selection of the "SOAP" key 108 to invoke the SOAP subsystem, will not suspend any session currently being processed by PC-CSMS.

Nonetheless, the SOAP subsystem can be invoked at any time during use of PC-CSMS. Still further, as described above, SOAPs are created for patient questions, DUR problems, commitment issues and other pharmacist concerns.

Upon selection of the "SOAP" key 108, PC-CSMS 24 displays a screen similar to that illustrated in Figure 5W on display device 20. A number of fields are displayed which are to be completed by the user, in this case, the pharmacist. The fields include "Context," "Subjective," "Objective," "Assessment," "Plan" and "Procedure." The meanings of subjective, objective, assessment and plan were previously described above. Context refers to the identity of the session being processed when the SOAP subsystem was invoked. For example, if the SOAP subsystem had been invoked during processing of a cognitive service record session, the context would be identified as "CSR." The user may also select a procedure to be completed as a result of the processing by the SOAP subsystem from a predefined list as indicated by the "_" symbol next to the "Procedure" field.

A number of options are provided by PC-CSMS for processing by the SOAP subsystem. These options include indicating that the SOAP process is completed by selecting the "OK" key 351, suspending the processing by the SOAP subsystem by selecting the "Suspend" key 352, canceling or terminating the processing of the current SOAP being processed by selecting the "Cancel" key 353, adding a RAR to the SOAP by selecting the

"Add RAR" key **354**, deleting the RAR associated with the SOAP by selecting the "Delete RAR" key **355**, and viewing the on-line help by selecting the "Help" key **356**. The SOAP may not be identified as being completed until all of the fields have been completed by the user.

- 5 Suspension of the SOAP merely suspends the SOAP to allow the user to complete the SOAP at a later time. The addition of a RAR adds a "blank" RAR to be associated with the SOAP. The "blank" RAR must be completed by the user at some later time.

10 If the SOAP interrupt is invoked for a particular patient and a number of SOAPS are already associated with the patient, a list of SOAPS will be displayed for the user. This allows the user to select an individual SOAP to process.

15 Suspension and cancellation of the SOAPS will be understood by those skilled in the art. Selection of "Cancel" key **353** or **363** will undo any changes during creation or update of a SOAP or a RAR.

Finally, as previously mentioned, the selection of the "Add RAR" key **354** adds a "blank" RAR associated with the present SOAP being processed. Upon selection of the "Add RAR" key **354**, the system displays a "blank" RAR on display device **20** similar to that illustrated in Figure 5X. If a RAR which is already associated with the current SOAP being processed by the SOAP subsystem is to be updated or at least reviewed by the user, the user may transfer control to the RAR subsystem by selecting the "RAR" tab displayed generally at **357** in Figure 5W. Similarly, while processing a "RAR," the user may return to the SOAP to which the present RAR is associated by selecting the "SOAP" tab illustrated at **357** in Figure 5X.

When creating a RAR using the RAR subsystem, a number of fields must be completed by the user. These fields, as illustrated in Figure 5X, include fields for "Reason," "Action," "Result," "Intervention," "Description," "Amount to Bill," "Procedure" and "Notes." Reason, action and result were previously described above and will not be repeated. The intervention field allows the user to enter the level of the intervention for purposes of recovering the value added by the pharmacist. In addition, the pharmacist should also include a description about the RAR encounter, any procedure to be performed, and complete any notes with respect to this RAR. The contents of the reason, action, result, intervention and procedure fields may

be selected from a predefined list as indicated by the "_" next to each of those respective fields.

The user may select from a number of options during processing of a RAR by the RAR subsystem. These options include indicating that the
5 creation or processing of the RAR is completed by selecting the "OK" key 361, suspending the processing of the RAR to permit completion of the RAR at a later date by selecting the "Suspend" key 362, canceling or terminating the processing of the present RAR by selecting the "Cancel" key 363, adding an additional "blank" RAR by selecting the "Add RAR" key 364,
10 deleting the present RAR by selecting the "Delete RAR" key 365, seeking on-line help from the system by selecting the "Help" key 366 or performing the procedure by selecting the "Perform Procedure" key 370. In addition, as indicated at the bottom of the screen illustrated in Figure 5X, the user may add, edit or delete notes by selecting the keys "Add" 367, "Edit" 368 or
15 "Delete" 369, respectively. Notably, a RAR cannot be deleted after it has been completed and identified as being "OK." In effect, identifying a RAR as being "OK" results in it being "committed" to the database. The content of the intervention field essentially relates to the amount of work performed by the pharmacist with respect to this particular RAR.

20 As previously described, more than one RAR may be associated with a single SOAP. As a result, a multiple number of "RAR" tabs may appear at 357 on the screen displayed in Figure 5X.

Referring to Figure 7, a high level flowchart illustrating the control of the processing by the SOAP subsystem in combination with the RAR
25 subsystem to allow multiple RARs to be associated with a single SOAP will now be described. A determination is made at 401 as to whether the SOAP subsystem was invoked. If it is determined at 401 that the SOAP subsystem was invoked, PC-CSMS will create a new SOAP or process an existing SOAP for the current patient being processed at 402. Once the SOAP is
30 completed, or even during the processing of a SOAP, the user may decide to create a first RAR. If it is determined at 403 that a first RAR is to be added, PC-CSMS will process the first RAR. If it is determined at 403 that a first RAR was not to be created or was not selected but rather a second RAR was selected for processing, control is transferred to block 405.

35 A determination is made at 405 as to whether a second RAR was to be created or was selected for processing. If a second RAR was to be

created or was selected for processing, a determination is then made at **406** as to whether the second RAR is associated with the same SOAP as the first RAR. If it is determined at **406** that the second RAR is associated with the same SOAP as the first RAR, the second RAR is processed at **407** and an association is made between the first RAR and the second RAR to indicate that the first RAR and the second RAR are associated with the same SOAP at **408**. Any additional RARs associated with the same SOAP will be processed at **409**, and upon completion of processing of any of the SOAPS, or on suspension or cancellation of any of the SOAPS, control is transferred to any session or interrupt selected by the user from those illustrated at **101-113** displayed on the screen illustrated in Figure 5A. If a determination is made at **405** that a second RAR is not to be processed, control simply remains with the SOAP subsystem as long as the SOAP is being processed, after which control will be transferred to any of the sessions or interrupts **101-113** illustrated in Figure 5A and selected by the user.

If a determination is made at **406** that the second RAR is not associated with the same SOAP as the first RAR, the second RAR is simply processed in association with the SOAP it is related to.

Detailed Operation: Note

PC-CSMS **24** also processes "Note" interrupts upon the selection of the "Note" key **109** by the user. Similar to processing of a SOAP interrupt by the SOAP subsystem, PC-CSMS displays a summary list of all notes for the particular patient presently being processed upon selection of the note interrupt. There are three types of notes processed by PC-CSMS, i.e., general notes, attentions and follow-ups. A general note records information about a patient or an encounter that does not fall within another field provided by the system. General notes not only appear in a note screen but also appear in the patient summary displayed during processing of the cognitive service record component of the patient intake subsystem as well as other processing. The general notes are associated with the patient using the patient ID number.

The attention note is used for the purpose of bringing some piece of information to the attention of a pharmacy employee at some later time. The attention note is flashed up on display device **20** during a specific stage of processing for a particular patient. The attention note also includes an

indication to associate the note with a particular part of the processing for the particular patient (i.e., intake subsystem, cognitive subsystem or counseling subsystem). Finally, a follow-up note provides a reminder to a pharmacy employee to perform some procedure. The follow-up note must be
5 processed by creating a SOAP for the follow-up note. The follow-up note also includes an indication as to when the follow-up with the patient is scheduled for, i.e., this visit, next visit, or date. When the date of the follow-up arrives, the follow-up note will appear in the incomplete list displayed on display device 20 during the encounter management portion of processing
10 by the counseling subsystem.

Referring to Figures 5Y, 5Z, 5AA and 5BB, the control of the processing of the note interrupt will now be described. Upon selection of the note interrupt key 109 by the user, a listing of the notes for the particular patient being processed is displayed on display device 20 as illustrated in
15 Figure 5Y. Information displayed on the screen may include patient notes as well as any details with respect to the notes. A number of options are available for processing during the note interrupt. These options include creating a new note by selecting the "New Note" key 421, creating a follow-up note by selecting the "Follow-Up" key 422, editing a note by selecting the
20 "Edit" note key 423, closing the note by selecting the "Close" key 424 and reviewing on-line help by selecting the "Help" key 425. If a new note is selected, one of Figures 5Z, 5AA or 5BB will be displayed. The particular progress note to be displayed will depend on which type of note (i.e., "General," "Attention" or "Follow-up") is selected and indicated in the "Type" field of the progress note. If the "Follow-up" key 422 is selected, a follow-up
25 note will be displayed. If the "Edit Note" key 423 is selected, the note highlighted in the patient note list will be displayed. Closing of the note indicates that the note has been processed. "Edit Note" key 423 is only enabled when the list of patient notes contains at least one note.

Referring to Figure 5Z, a "General" note is illustrated as indicated by
30 the indication next to "General" in the type field. Each note includes a field to be completed by the user to indicate the context for the note. Each note can also be reviewed, updated or closed. By selecting the "OK" key 431 in Figure 5Z, any updates to the notes are saved. If the "Cancel" key 432
35 is selected, any updates initiated during the current processing of the progress

note are cancelled. If the "Help" key 433 is selected, on-line assistance can be accessed.

Referring to Figure 5AA, an "Attention" note is illustrated. Similar to the general note, the attention note also includes a field to indicate the context for the note as well as "OK," "Cancel" and "Help" keys 441, 442 and 443, respectively. In addition, an indication that the particular note is of the type "Attention" is also displayed as illustrated in the type field. Finally, the attention note also includes a field for listing the part of the process during which the note is to be drawn to the attention of the pharmacy employee (i.e., intake, cognitive or counseling).

Referring to Figure 5BB, a "Follow-up" note is illustrated. Similar to the general note and attention note, the follow-up note also includes a context field and a field for indicating the type of the note as well as the "OK" key 451, "Cancel" key 452 and "Help" key 453. In addition, the follow-up note includes a field for indicating when the note is to be processed (i.e., this visit, next visit, or a particular date), and a calendar which highlights the date for processing the note.

Detailed Operation: Drug Monograph Subsystem

The user may invoke the drug monograph interrupt subsystem by selecting the "Mono" key 110. Similar to the SOAP and Note interrupt subsystems, invoking of the drug monograph subsystem does not suspend any processing of any session. Rather, invoking the drug monograph subsystem results in interruption and termination of the current session being processed by PC-CSMS. Generally, the drug monograph subsystem is simply an interface provided between PC-CSMS and a drug database to allow the user to access drug information. This interface with a drug database will be understood generally by those having skill in the art and may take any number of forms for interfaces between a system such as PC-CSMS 24 and any of the standard drug databases, including that marketed by Medi-Span of Indianapolis, Indiana.

Pharmaceutical Care Cognitive Services Management System Menu Bar

The PC-CSMS menu bar illustrated in Figure 5A which includes the menu bar entries of "File," "Edit," "Views," "Action," "Reports," "Utilities," and "Help" operates like any other menu bar in a Windows environment.

Selection of any one of these entries in the menu bar will result in the "pulling down" of a menu from which the user may select a variety of options. Selection of the "File" entry in the menu bar will result in displaying of a menu providing the options of "Save" or "Exit." Selection of the menu bar entry "Edit" provides the user with the options of "Undo," "Cut," "Copy," or "Paste." Selection of the menu bar entry "Views" results in the "pulling down" of a menu providing the user with the options of "Orders," "Patient," "CSR," "Cognitive," or "Counseling." Still further, selection of the menu bar entry "Action" results in the display of a pull-down menu providing the user with the options of "Open PT," "Refill Rx," "SOAP," "Note," and "Monograph." Similarly, selection of the "Reports" option from the menu bar results in the display of a pull-down menu providing the user with the options of "Patient Intake" and "To Do List." Still further, selection of the "Utilities" option from the menu bar results in the display of a pull-down menu providing the user with the options of "Users," "Drug List," "Physicians," and "Diagnoses." Finally, selection of the menu bar entry "Help" will result in the display of a pull-down menu for help options.

Working Example of Multiple RARs
Associated With a Single SOAP

Referring to Figures 5CC-5EE, a working example of multiple RARs associated with a single SOAP will now be described. Upon selecting the SOAP key 108, a "blank" SOAP tab will be displayed on display device 20. The blank SOAP tab prompts the user to complete the "Context," "Subjective," "Objective," "Assessment," "Plan" and "Procedure" fields. In the particular example illustrated in Figure 5CC, the Context is "CSR" which is selected from a list of predefined context as indicated by the "_" symbol adjacent to the Context field. The user of the system then proceeds to complete the Subjective, Objective, Assessment and Plan fields. In this particular example, the pharmacist has made a subjective observation of the patient in that he believes the patient drinks heavily and has entered this subjective information into the Subjective field. In addition, the pharmacist also has made an objective or factual based observation in that the patient's eyes appear to be bloodshot and his breath smells like liquor at 11:00 a.m., and has entered this factual based information in the Objective field. The user is then prompted to enter an assessment based on the subjective and

objective information in the Assessment field. In this particular example, the pharmacist assesses the situation indicating that there could be possible complications with the drug therapy as well as general health problems. Finally, in response to the interactive prompting by the pharmaceutical care cognitive services management system, the pharmacist enters his Plan to be followed based on the assessment. In this particular case, the pharmacist has selected the plan of talking to the patient about complications with the drug therapy and talking to the patient's physician about health issues. The pharmacist has decided not to enter any procedure in the Procedure field at this point.

At this point, the pharmacist can either indicate that the SOAP is completed and commit the SOAP to the database by selecting the "OK" key 351, suspend the processing of the SOAP at this time by selecting the "Suspend" key 352, cancel any updates made to the SOAP by selecting the "Cancel" key 353 or add a RAR to the SOAP by selecting the "Add RAR" key 354.

In response to the selection by the user of the "Add RAR" key 354 in Figure 5CC, a blank "RAR" tab screen will be displayed on display device 20 prompting the user to complete the various fields for this first RAR associated with the SOAP. The first RAR of this working example is illustrated in Figure 5DD. The user is prompted to complete the "Reason," "Action," "Result," "Intervention," "Description," "Procedure" and "Notes" fields. The user entry for the Reason, Action, Result and Intervention fields may be selected from predefined lists as indicated by the "_" symbol adjacent to each of those respective fields. In this particular example, the pharmacist, in response to the prompt to complete the Reason field, indicated that the reason was alcohol precaution. In addition, in response to the prompt to complete the Action field, the user entered the action of patient education/instruction. Still further, in response to the system's prompting the user to complete the Result field, the user entered the result as unchanged drug therapy. Still further, in response to the system's prompting the user to complete the Intervention field, the user selected Level 2 for a low complexity or an intervention of less than 15 minutes from the predefined list of intervention options. The user also entered an indication in the Description field that the patient was not forthcoming about the alcohol

problem and that the pharmacist is still concerned. Finally, the pharmacist decided not to enter any procedure or notes for this particular RAR.

During the process of completing the RAR, the user has the options of indicating that the RAR has been completed and committing the RAR to the database by selecting the "OK" key 361, suspending the processing of the RAR and allowing it to be completed at a later time by selecting the "Suspend" key 362, or cancelling the updates made to the RAR during this session by selecting the "Cancel" key 363. In addition, the user may add an additional RAR by selecting the "Add RAR" key 364 or delete this RAR by selecting the "Delete RAR" key 365. Finally, the user could select the "Add" key 367 to add a note.

Assuming for purposes of this example that upon completing the first RAR illustrated in Figure 5DD, the user selected the "Add RAR" key 364, a second "blank" RAR screen will be displayed on display device 20. An example of the second RAR completed by the user for this example is illustrated in Figure 5EE. PC-CSMS prompts the user to complete the Reason, Action, Result, Intervention, Description, Procedure and Notes fields as with other RARs. In this particular example of the second RAR, the user has selected the same reason as being alcohol precaution. Since this is a different RAR, the user has selected a different action, i.e., prescriber consulted, to indicate that an action different from that taken in the first RAR is to be taken in this second RAR. The user in the second RAR also selected the unchanged drug therapy as the result. In this second RAR, the user indicated that the intervention level was Level 3 indicating that the intervention required by the pharmacist to consult with the physician was of moderate complexity or less than 30 minutes. Finally, the user indicated in the Description field that the doctor was aware of the problem and is trying to get the patient into alcohol therapy. Similar to any other RAR, the user may select the options of "OK," "Suspend," "Cancel," "Add RAR" and "Delete RAR."

As noted above, the user could add a third and a fourth RAR to this particular SOAP. In any event, each of these RARs are associated with the SOAP indicated at the tab adjacent to the RAR tab in Figures 5CC-5EE.

Working Example of Patient Interrupt

Referring to Figures 5FF-5KK, a working example of processing by the patient interrupt subsystem of a patient interrupt will now be described. Upon selecting the "Pt." key 106, PC-CSMS 24 will suspend the current session if the current session is either a cognitive or a counseling session.

5 In response to selection of the "Pt." key 106, PC-CSMS 24 will prompt the user to indicate whether the user wants to suspend the cognitive or counseling session, or cancel the interrupt and continue the cognitive or counseling session (see Figures 5S and 5T). If the user selects to suspend the present cognitive or counseling session, the present session will be

10 suspended and control is transferred to the patient intake subsystem, and displays "Patient Intake" on display device 20. Otherwise, the user may cancel any other session being currently processed and transfer control to the "Patient Intake" display.

Referring to Figure 5FF, the system prompts the user to enter the

15 name of the patient interrupting the user in the fields "Last Name" and "First Name" as illustrated in Figure 5FF. If no names are displayed in a list of names, then the user must enter the "Last Name" and "First Name" in the appropriate fields. Otherwise, if names are listed in the list of names, the user may select one of those names by either entering the name in the "Last

20 Name" and "First Name" fields or selecting the name from the list using an appropriate input device. While the "Last Name" and "First Name" fields remain empty, the "Pt Chart" key 291, "Pt Requests" 292, "New Pt" key 293 and "Search" key 296 are not enabled.

Upon entering a last name such as, for example, a name beginning

25 with the letter "R" as illustrated in Figure 5GG, PC-CSMS 24 then displays a list of patient names in the Name Table and searches the list of names for a match between the name entered by the user and those contained in the list of patient names. Upon locating the first match, PC-CSMS then enables "Pt Chart" key 291 and "Pt Requests" key 292 to permit the user to either

30 transfer control to the patient chart component of the patient intake subsystem for the patient listed, or take in a prescription for the patient listed by selecting the "Pt Chart" key 291 or "Pt Requests" key 292, respectively.

As the user continues to enter the name of the second patient who is interrupting the user, PC-CSMS 24 will continue to search the list of patient

35 names for the closest match among those names listed in the list of patient names. Referring to Figure 5HH, the user has entered "Rogers" in the Last

Name field and "Christy" in the First Name field. In response, PC-CSMS 24 locates the name "Rogers, Christy Kane" in the list of patient names. The system, in addition to continuing to enable the "Pt Chart" key 291 and "Pt Requests" key 292, also enables the "New Pt" key 293 since PC-CSMS is not sure whether the patient name entered by the user is the patient highlighted in the list of patient names or is a new patient with the same first name. At this stage, the user may either select to review the patient chart or intake a prescription for this patient during which steps the user will confirm that this interrupting second patient is the same as the patient name highlighted in the list of patient names. However, if the user knows that the patient name entered by the user is not the same person as that highlighted in the list of patient names, the user can then transfer to process this second patient as a new patient by selecting the "New Pt" key 293.

Assuming for purposes of this example that the user selects the "Pt Chart" key 291, control is transferred to the patient chart component of the patient intake subsystem resulting in display of the "General" tab as illustrated in Figure 5II for the patient name highlighted in the list of patient names illustrated in Figure 5HH. At this point, the user can determine based on the personal information listed in the general tab for the patient chart for the second patient whether the second patient is, in fact, the same as the patient whose information is displayed on the screen illustrated in Figure 5II. Thus, the user can review the patient chart. In addition, at this stage, the user can also update any field of the patient chart within any of the tabs including "General," "Insurance," "Medical," "Miscellaneous," "Drug Profile" and "CSR History."

Referring to Figure 5HH, if the user selected the "Pt Requests" key 292 for the patient whose name is highlighted in the list of patient names, control is transferred to the cognitive service record component of the patient intake subsystem to begin the task of taking in an over-the-counter or prescription drug. As a result, PC-CSMS 24 displays the "Requests" tab for the cognitive service record for the patient whose name was highlighted in the list of patient names in Figure 5HH (see Figure 5JJ). At this point, processing by the interrupt subsystem of the patient interrupt continues with the processing of the cognitive service record component in the same manner as that described above with respect to the processing of cognitive service record sessions.

Referring again to Figure 5GG, if the user entered a name in the First Name field such that PC-CSMS 24 would not find a match with those names contained in the list of patient names, no names would be displayed in that list of patient names, and PC-CSMS24 would enable the "New Pt" key 293 but disable the "Pt Chart" key 291 and "Pt Requests" key 292. Referring to Figure 5KK, the user entered the name "Frank" in the First Name field resulting in the finding of no match with any of the names contained in the list of patient names. As a result, the user can only select to add the second patient who is interrupting the user (i.e., Frank Rogers) as a new patient to PC-CSMS or terminate the patient interrupt, or seek on-line help.

Assuming for purposes of this example that the user decided to add the interrupting patient (i.e., Frank Rogers) as a new patient to PC-CSMS 24, the system will open a new patient chart upon the selection of the "New Pt" key 293 and transfer control to the new patient chart for this new patient. As a result of the transfer of control, PC-CSMS displays the "General" tab for the new patient chart which contains only the "Last Name" and the "First Name" of the new patient as illustrated in Figure 5LL. At this point, the user may continue to collect information relating to the patient's identity and history to be included in the patient chart and stored by PC-CSMS 24. Thereafter, processing continues as previously described with respect to the detailed operation of the patient chart component of the patient intake subsystem noted above. Upon completion of the processing of the patient chart for the new patient, PC-CSMS 24 may resume processing of the interrupted or suspended cognitive or counseling session by transferring control to the cognitive subsystem or counseling subsystem, respectively.

Working Example of a Refill Interrupt

Referring to Figures 5MM-5RR, a working example of processing by the interrupt subsystem of a refill interrupt will now be described. Upon selecting "Refill" key 107, PC-CSMS 24 will suspend the session presently being processed if the present session is a cognitive or counseling session, process the refill interrupt, and upon completion of processing of the refill interrupt, resume processing of the suspended cognitive or counseling session. The user has the option of preventing the suspension of the current cognitive or counseling session, and rather, cancelling the interrupt and continuing the present cognitive or counseling session. Upon selection of

the Refill key 107 from the display illustrated in Figure 5MM, PC-CSMS 24 indicates that the "Refill" interrupt has been invoked and then displays a screen prompting the user to enter the number for the prescription which is to be refilled by displaying the screen illustrated in Figure 5NN. Until the user enters a prescription number, only the "Find Pt" key 302, "Cancel" key 303 and "Help" key 304 are enabled. The "Refill" key 301 is not enabled until a prescription number is entered by the user and PC-CSMS confirms that the entered prescription is valid. Once the user enters a prescription number in the appropriate field, PC-CSMS 24 searches the data storage device to determine whether the prescription number is a valid prescription (i.e., whether the prescription number is in the data storage device). In this example, PC-CSMS 24 has determined that the prescription number entered by the user (i.e., "0000004") is a valid prescription number and, as a result, displays basic information relating to the prescription number on display device 20 as illustrated in Figure 5OO. In addition, upon determining that the prescription is valid, PC-CSMS 24 enables the "Refill" key 301 to allow the user to request that the prescription be refilled.

Upon selection of the "Refill" key 301, PC-CSMS 24 transfers control to the cognitive service record component of the patient intake subsystem resulting in the display of the "Request" tab of the cognitive service record on display device 20 as illustrated in Figure 5PP. Information for the drug corresponding to the prescription number will be displayed in the current prescription list. At this point, processing continues with the refill interrupt in the same manner as it does for processing of the cognitive service record described above. Once processing by the interrupt subsystem of the refill interrupt is completed for the second patient, PC-CSMS 24 may resume processing of the suspended cognitive or counseling session.

As mentioned above, the user is prompted to enter a prescription number as illustrated in Figure 5NN. In response to this prompting, the user entered the number "0000003." Upon receiving the entry of this prescription number, PC-CSMS 24 compares the prescription number against those prescription numbers contained in the data storage device to determine whether the prescription number is valid. In this example, the user entered the prescription number "0000003," which is not valid as illustrated in Figure 5QQ. As a result, no information is displayed in the prescription information section. Further, the "Refill" key 301 is disabled. The only options

available to the user are to find the patient, cancel the refill interrupt or seek on-line help. In response to the selection of the "Find Pt." key 302, PC-CSMS 24 begins processing what is essentially the patient interrupt by displaying on display device 20 the patient intake screen as illustrated in
5 Figure 5RR. As a result, the user is prompted to enter the last name of the second patient who is interrupting the cognitive or counseling session. Thereafter, PC-CSMS 24 processes this refill interrupt as in the same manner as that for a patient interrupt, and upon completion of the processing of this interrupt, resumes processing of the suspended cognitive or
10 counseling session.

In the drawings and specification, there have been disclosed typical preferred embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the
15 following claims.

THAT WHICH IS CLAIMED:

1. A computer based pharmaceutical care cognitive services management method which executes on a computer system including
5 processing means, data storage means, display means and input means, said computer based pharmaceutical care cognitive services management method comprising the steps of:
prompting on said display means for user entry via said input means, and for storing in said data storage means, of identity and history information
10 corresponding to a patient;
prompting on said display means for user entry via said input means, and for storing in said data storage means, of subjective information relating to assessed characteristics of said patient and objective information relating to said patient's history of drug use;
15 prompting on said display means for user entry via said input means, and for storing in said data storage means, of an assessment of said patient based upon said subjective information and said objective information;
prompting on said display means for user entry via said input means, and for storing in said data storage means, of a plan to follow based on said
20 assessment;
prompting on said display means for user entry via said input means, and for storing in said data storage means, of a first reason for the assessment and the plan, a first action in response to the assessment and the plan, and a first result based on the first action;
25 prompting on said display means for user entry via said input means, and for storing in said data storage means, of a second reason for the assessment and the plan, a second action in response to the assessment and the plan, and a second result based on the second action; and
associating the stored first reason, first action and first result and the
30 stored second reason, second action and second result with the stored subjective information, objective information, assessment and plan, such that a plurality of reasons, actions and results are associated with the stored subjective information, objective information, assessment and plan for a patient.
35 2. The computer based pharmaceutical care cognitive services management method of Claim 1 further comprising the steps of:

generating a first billing statement for said patient based on the stored first reason, first action and first result; and

generating a second billing statement for said patient based on the stored second reason, second action and second result;

5 such that two billing statements are generated for one patient based on the stored subjective information, objective information, assessment and plan.

3. The computer based pharmaceutical care cognitive services management method of Claim 1 further comprising the steps of:

10 prompting on said display means for user entry via said input means, and for storing in said data storage means, of a third reason for the assessment and the plan, a third action in response to the assessment and the plan, and a third result based on the third action;

15 associating the stored third reason, third action and third result with the stored first reason, first action and first result, the stored second reason, second action and second result, and the stored subjective information, objective information, assessment and plan, such that the stored first reason, first action and first result, the stored second reason, second action and second result and the stored third reason, third action and third result are
20 each associated with the stored subjective information, objective information, assessment and plan for a patient.

4. The computer based pharmaceutical care cognitive services management method of Claim 3 further comprising the step of:

25 generating a third billing statement for said patient based on the stored third reason, third action and third result;

 such that a third billing statement is generated for one patient based on the stored subjective information, objective information, assessment and plan.

5. The computer based pharmaceutical care cognitive services management method of Claim 1 further comprising the steps of:

30 prompting on said display means for user entry via said input means, and for storing in said data storage means, of an identification of a drug; and associating the identification of the drug stored in said data storage means with the identity of said patient stored in said data storage means.

35 6. The computer based pharmaceutical care cognitive services management method of Claim 5 further comprising the steps of:

comparing the identification of the drug stored in said data storage means and the identity and history information corresponding to said patient stored in said data storage means; and

5 prompting for user entry via said input means, and for storing in said data storage means, of alteration of said identification of said drug based on the result of said comparing step, and said stored subjective information, objective information, assessment and plan;

 such that the identification of said drug is changed by said user.

10 7. The computer based pharmaceutical care cognitive services management method of Claim 5 further comprising the step of:

 transferring the identification of the drug in association with the identity of said patient to a dispensing system;

 such that said drug is dispensed to said patient.

15 8. The computer based pharmaceutical care cognitive services management method of Claim 5 further comprising the steps of:

 generating a billing statement for said patient based on the identification of the drug stored in said storage means;

20 such that a billing statement is generated for said patient based on the stored subjective information, objective information, assessment and plan.

25 9. The computer based pharmaceutical care cognitive services management method of Claim 1 further comprising the step of generating a report for said patient based on said stored subjective information, objective information, assessment and plan, said stored first reason, first action and first result, and said stored second reason, second action and second result.

30 10. A computer based pharmaceutical care cognitive services management method which executes on a computer system including processing means, data storage means, display means and input means, said computer based pharmaceutical care cognitive services management method comprising the steps of:

 prompting on said display means for user entry via said input means, and for storing in said data storage means, of identity and history information corresponding to a patient;

35 prompting on said display means for user entry via said input means, and for storing in said data storage means, of an identification of a drug;

associating the identification of the drug stored in said data storage means with the identity of said patient stored in said data storage means;

comparing the identification of the drug stored in said data storage means and the identity and history information corresponding to said patient
5 stored in said data storage means, to produce an indication of possible incompatibilities between said drug and said patient;

prompting on said display means for user entry via said input means of alteration of said identification of said drug based on the indications of the possible incompatibilities between said drug and said patient resulting from
10 said comparing step;

suspending said step of prompting on said display means for user entry via said input means of alteration of said identification of said drug based on the indications of the possible incompatibilities between said drug and said patient resulting from said comparing step, in response to a user
15 interrupt;

displaying on said display means information concerning a second patient in response to the user interrupt; and

resuming said step of prompting for user entry via said input means of alteration of said identification of said drug, in response to completion of said
20 step of displaying on said display means information concerning the second patient.

11. The computer based pharmaceutical care cognitive services management method of Claim 10 further comprising the steps of:

prompting on said display means for user entry via said input means
25 of results of a counseling session with said patient concerning the identification of said drug and the results of said comparing step;

suspending said step of prompting for user entry via said input means of results of a counseling session with said patient concerning the identification of said drug and the results of said comparing step, in
30 response to a user interrupt;

displaying on said display means information concerning a third patient in response to a user interrupt; and

resuming said step of prompting for user entry via said input means of results of a counseling session with said patient concerning the identification
35 of said drug and the results of said comparing step.

12. The computer based pharmaceutical care cognitive services management method of Claim 10 wherein the following steps are performed between said step of displaying information concerning a second patient in response to a user interrupt and said resuming step:

5 displaying on said display means a list of patient identities;
 receiving a user selection of a patient name entered by a user via said input means; and

 comparing the patient name selected by the user with the list of patient identities, to produce an indication that the patient name selected by
10 the user is the same as one of the patient names contained in the list of patient identities.

13. The computer based pharmaceutical care cognitive services management method of Claim 12 wherein said step of comparing the patient name with the list of patient identities is followed by the steps of:

15 enabling a user selection to display on said display means at least a portion of the identity and history information for the patient name selected by the user in response to an indication that the patient name selected by the user is the same as one of the patient names contained in the list of patient identities;

20 receiving a user selection to display on said display means at least a portion of the identity and history information for the patient name selected by the user; and

 displaying on said display device at least a portion of the identity and history information for the patient name selected by the user in response to
25 the step of receiving a user selection to display on said display means at least a portion of the identity and history information for the patient name selected by the user.

14. The computer based pharmaceutical care cognitive services management method of Claim 12 wherein said step of comparing the patient
30 name with the list of patient identities is followed by the steps of:

 enabling a user selection to display on said display means a prompt for user entry via said input means of an identification of a drug in response to an indication that the patient name selected by the user is the same as one of the patient names contained in the list of patient identities;

35 receiving a user selection to display on said display means a prompt for user entry via said input means of an identification of a drug; and

displaying on said display means a prompt for user entry via said input means of an identification of a drug in response to the step of receiving a user selection to display on said display means a prompt for user entry via said input means of an identification of a drug.

5 15. The computer based pharmaceutical care cognitive services management method of Claim 12 wherein said step of comparing the patient name with the list of patient identities is followed by the steps of:

 enabling a user selection to display on said display means the patient name selected by the user in response to an indication that the patient name
10 selected by the user is not the same as one of the patient names contained in the list of patient identities;

 receiving a user selection to display on said display means the patient name selected by the user; and

 displaying on said display device the patient name selected by the
15 user in response to the step of receiving a user selection to display on said display means the patient name selected by the user; and

 prompting on said display means for user entry via said input means, and for storing in said data storage means, of identity and history information corresponding to the patient name selected by the user.

20 16. The computer based pharmaceutical care cognitive services management method of Claim 10 further comprising the steps of:

 prompting on said display means for user entry via said input means of a second identification of a drug in response to the user interrupt;

 receiving user entry via said input means of the second identification
25 of a drug; and

 comparing the second identification of a drug received via said input means with the identification of a drug stored in said data storage means, to produce an indication that the second identification of a drug is the same as the identification of the drug stored in said data storage means.

30 17. The computer based pharmaceutical care cognitive services management method of Claim 16 wherein said step of comparing the second identification of a drug with the identification of a drug stored in said data storage means is followed by the steps of:

 enabling a user selection to display on said display means the
35 identification of a drug and at least a portion of the identity and history information of the patient associated with the identification of the drug in

response to an indication that the second identification of a drug is the same as the identification of the drug stored in said data storage means;

receiving a user selection to display on said display means the identification of a drug and at least a portion of the identity and history

5 information of the patient associated with the identification of the drug; and

displaying on said display means the identification of a drug and at least a portion of the identity and history information of the patient associated with the identification of the drug in response to the step of receiving a user

10 selection to display on said display means the identification of a drug and at least a portion of the identity and history information of the patient associated with the identification of the drug.

18. The computer based pharmaceutical care cognitive services management method of Claim 16 wherein said step of comparing the second identification of a drug with the identification of a drug stored in said

15 data storage means is followed by the steps of:

enabling user selection to display on said display means a list of patient identities;

receiving user selection to display on said display means a list of patient identities;

20 displaying on said display means a list of patient identities in response to the step of receiving user selection to display a list of patient identities;

receiving user selection of a patient name entered by a user via said input means; and

25 comparing the patient name selected by the user with the list of patient identities, to produce an indication that the patient name selected by the user is the same as one of the patient names contained in the list of patient identities.

19. A computer based pharmaceutical care cognitive services management system comprising:

30 a computer system including processing means, data storage means, display means and input means;

first prompting means, for prompting on said display means for user entry via said input means, and for storing in said data storage means, of

35 identity and history information corresponding to a patient;

second prompting means, for prompting on said display means for user entry via said input means, and for storing in said data storage means, of subjective information relating to assessed characteristics of said patient and objective information relating to said patient's history of drug use;

5 third prompting means, for prompting on said display means for user entry via said input means, and for storing in said data storage means, of an assessment of said patient based upon said subjective information and said objective information;

10 fourth prompting means, for prompting on said display means for user entry via said input means, and for storing in said data storage means, of a plan to follow based on said assessment;

15 fifth prompting means, for prompting on said display means for user entry via said input means, and for storing in said data storage means, of a first reason for the assessment and the plan, a first action in response to the assessment and the plan, and a first result based on the first action;

20 sixth prompting means, for prompting on said display means for user entry via said input means, and for storing in said data storage means, of a second reason for the assessment and the plan, a second action in response to the assessment and the plan, and a second result based on the second action; and

25 associating means, for associating the stored first reason, first action and first result and the stored second reason, second action and second result with the stored subjective information, objective information, assessment and plan, such that a plurality of reasons, actions and results are associated with the stored subjective information, objective information, assessment and plan for said patient.

20. The computer based pharmaceutical care cognitive services management system of Claim 19 further comprising:

30 first generating means, for generating a first billing statement for said patient based on the stored first reason, first action and first result; and

 second generating means, for generating a second billing statement for said patient based on the stored second reason, second action and second result;

35 such that two billing statements are generated for said patient based on the stored subjective information, objective information, assessment and plan.

21. The computer based pharmaceutical care cognitive services management system of Claim 19 further comprising:

seventh prompting means, for prompting on said display means for user entry via said input means, and for storing in said data storage means, of an identification of a drug; and

second associating means, for associating the identification of the drug stored in said data storage means with the identity of said patient stored in said data storage means.

22. The computer based pharmaceutical care cognitive services management system of Claim 21 further comprising:

comparing means, for comparing the identification of the drug stored in said data storage means and the identify and history information corresponding to said patient stored in said data storage means to produce an indication of possible incompatibilities between said drug and said patient; and

eighth prompting means, for prompting for user entry via said input means, and for storing in said data storage means, of alteration of said identification of said drug based on the indication of possible incompatibilities, and said stored subjective information, objective information, assessment and plan;

such that the identification of said drug is changed by said user.

23. The computer based pharmaceutical care cognitive services management system of Claim 21 further comprising:

a dispensing system; and

transferring means, for transferring the identification of the drug in association with the identity of said patient to said dispensing system; such that said drug is dispensed to said patient.

24. The computer based pharmaceutical care cognitive services management system of Claim 21 further comprising:

generating means, for generating a billing statement for said patient based on the identification of the drug stored in said storage means;

such that a billing statement is generated for said patient based on the stored subjective information, objective information, assessment and plan.

25. A computer based pharmaceutical care cognitive services management system comprising:

a computer system including processing means, data storage means, display means and input means;

first prompting means, for prompting on said display means for user entry via said input means, and for storing in said data storage means, of
5 identity and history information corresponding to a patient;

second prompting means, for prompting on said display means for user entry via said input means, and for storing in said data storage means, of an identification of a drug;

10 associating means, for associating the identification of the drug stored in said data storage means with the identity of said patient stored in said data storage means;

comparing means, for comparing the identification of the drug stored in said data storage means and the identify and history information corresponding to said patient stored in said data storage means, to produce
15 an indication of possible incompatibilities between said drug and said patient;

third prompting means, for prompting on said display means for user entry via said input means of alteration of said identification of said drug based on the indications of the possible incompatibilities between said drug
20 and said patient resulting from said comparing step;

suspending means, for suspending processing by said third prompting means, prompting for user entry of alteration of said identification of said drug in response to a user interrupt;

25 displaying means, for displaying on said display means information concerning a second patient in response to the user interrupt; and

resuming means, for resuming processing by said third prompting means, prompting for user entry via said input means of alteration of said identification of said drug, in response to completion of processing by said displaying means for displaying information concerning the second patient.

30 26. The computer based pharmaceutical care cognitive services management system of Claim 25 further comprising:

fourth prompting means, for prompting on said display means for user entry via said input means of results of a counseling session with said patient concerning the identification of said drug and the indication of
35 possible incompatibilities between said drug and said patient;

second suspending means, for suspending processing by said fourth prompting means, for prompting for user entry of results of a counseling session with said patient in response to a user interrupt;

5 second displaying means, for displaying on said display means information concerning a third patient in response to a user interrupt; and

second resuming means, for resuming processing by said fourth prompting means, for prompting for user entry of results of a counseling session with said patient concerning the identification of said drug and the indication of possible incompatibilities between said drug and said patient.

10 27. The computer based pharmaceutical care cognitive services management system of Claim 25 further comprising:

second displaying means, for displaying on said display means a list of patient identities;

15 receiving means, for receiving a user selection of a patient name entered by a user via said input means; and

second comparing means, for comparing the patient name selected by the user with the list of patient identities, to produce an indication that the patient name selected by the user is the same as one of the patient names contained in the list of patient identities.

20 28. The computer based pharmaceutical care cognitive services management system of Claim 27:

enabling means, for enabling a user selection to display on said display means at least a portion of the identity and history information for the patient name selected by the user in response to an indication that the
25 patient name selected by the user is the same as one of the patient names contained in the list of patient identities;

second receiving means, for receiving a user selection to display on said display means at least a portion of the identity and history information for the patient name selected by the user; and

30 third displaying means, for displaying on said display device at least a portion of the identity and history information for the patient name selected by the user in response to the user selection to display on said display means at least a portion of the identity and history information for the patient name selected by the user received by said second receiving means.

35 29. The computer based pharmaceutical care cognitive services management system of Claim 27 further comprising:

enabling means, for enabling a user selection to display on said display means a prompt for user entry via said input means of an identification of a drug in response to an indication that the patient name selected by the user is the same as one of the patient names contained in the list of patient identities;

second receiving means, for receiving a user selection to display on said display means a prompt for user entry via said input means of an identification of a drug; and

third displaying means, for displaying on said display means a prompt for user entry via said input means of an identification of a drug in response to the user selection to display on said display means a prompt for user entry via said input means of an identification of a drug received by said second receiving means.

30. The computer based pharmaceutical care cognitive services management method of Claim 27 further comprising:

enabling means, for enabling a user selection to display on said display means the patient name selected by the user in response to an indication that the patient name selected by the user is not the same as one of the patient names contained in the list of patient identities;

second receiving means, for receiving a user selection to display on said display means the patient name selected by the user; and

third displaying means, for displaying on said display device the patient name selected by the user in response to the user selection to display on said display means the patient name selected by the user received by said second receiving means; and

fourth prompting means, for prompting on said display means for user entry via said input means, and for storing in said data storage means, of identity and history information corresponding to the patient name selected by the user.

31. The computer based pharmaceutical care cognitive services management system of Claim 25 further comprising:

fourth prompting means, for prompting on said display means for user entry via said input means of a second identification of a drug in response to the user interrupt;

second receiving means, for receiving user entry via said input means of the second identification of a drug; and

second comparing means, for comparing the second identification of a drug received via said input means with the identification of a drug stored in said data storage means, to produce an indication that the second identification of a drug is the same as the identification of the drug stored in said data storage means.

32. The computer based pharmaceutical care cognitive services management system of Claim 31 further comprising:

enabling means, for enabling a user selection to display on said display means the identification of a drug and at least a portion of the identity and history information of the patient associated with the identification of the drug in response to an indication that the second identification of a drug is the same as the identification of the drug stored in said data storage means;

third receiving means, for receiving a user selection to display on said display means the identification of a drug and at least a portion of the identity and history information of the patient associated with the identification of the drug; and

second displaying means, for displaying on said display means the identification of a drug and at least a portion of the identity and history information of the patient associated with the identification of the drug in response to the user selection, received by said third receiving means, to display on said display means the identification of a drug and at least a portion of the identity and history information of the patient associated with the identification of the drug.

33. The computer based pharmaceutical care cognitive services management system of Claim 31 further comprising:

enabling means, for enabling user selection to display on said display means a list of patient identities;

third receiving means, for receiving user selection to display on said display means a list of patient identities;

second displaying means, for displaying on said display means a list of patient identities in response to the user selection to display a list of patient identities received by said third receiving means;

fourth receiving means, for receiving user selection of a patient name entered by a user via said input means; and

third comparing means, for comparing the patient name selected by the user with the list of patient identities, to produce an indication that the

patient name selected by the user is the same as one of the patient names contained in the list of patient identities.

1/54

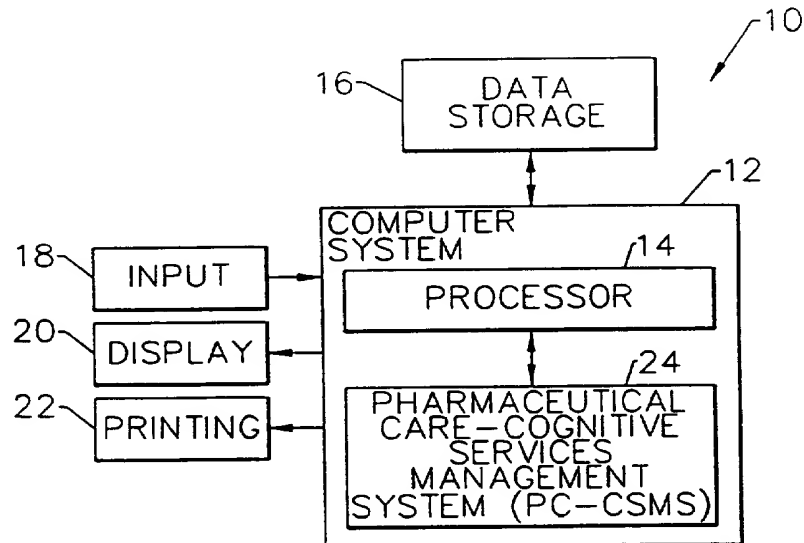


FIG. 1.

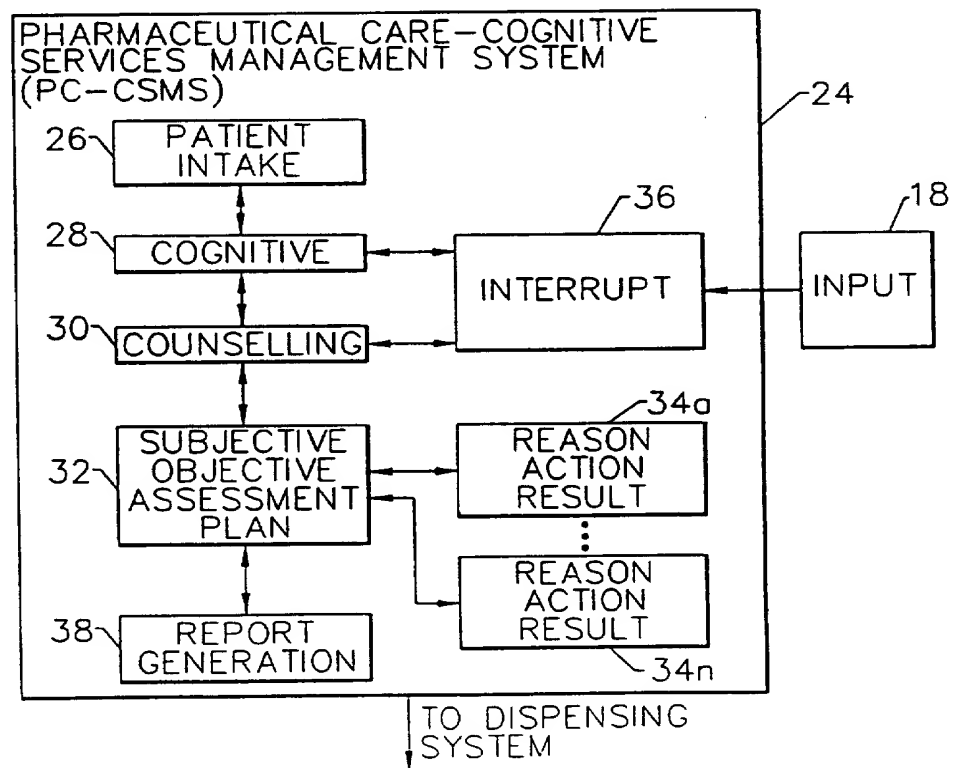


FIG. 2.

2 / 54

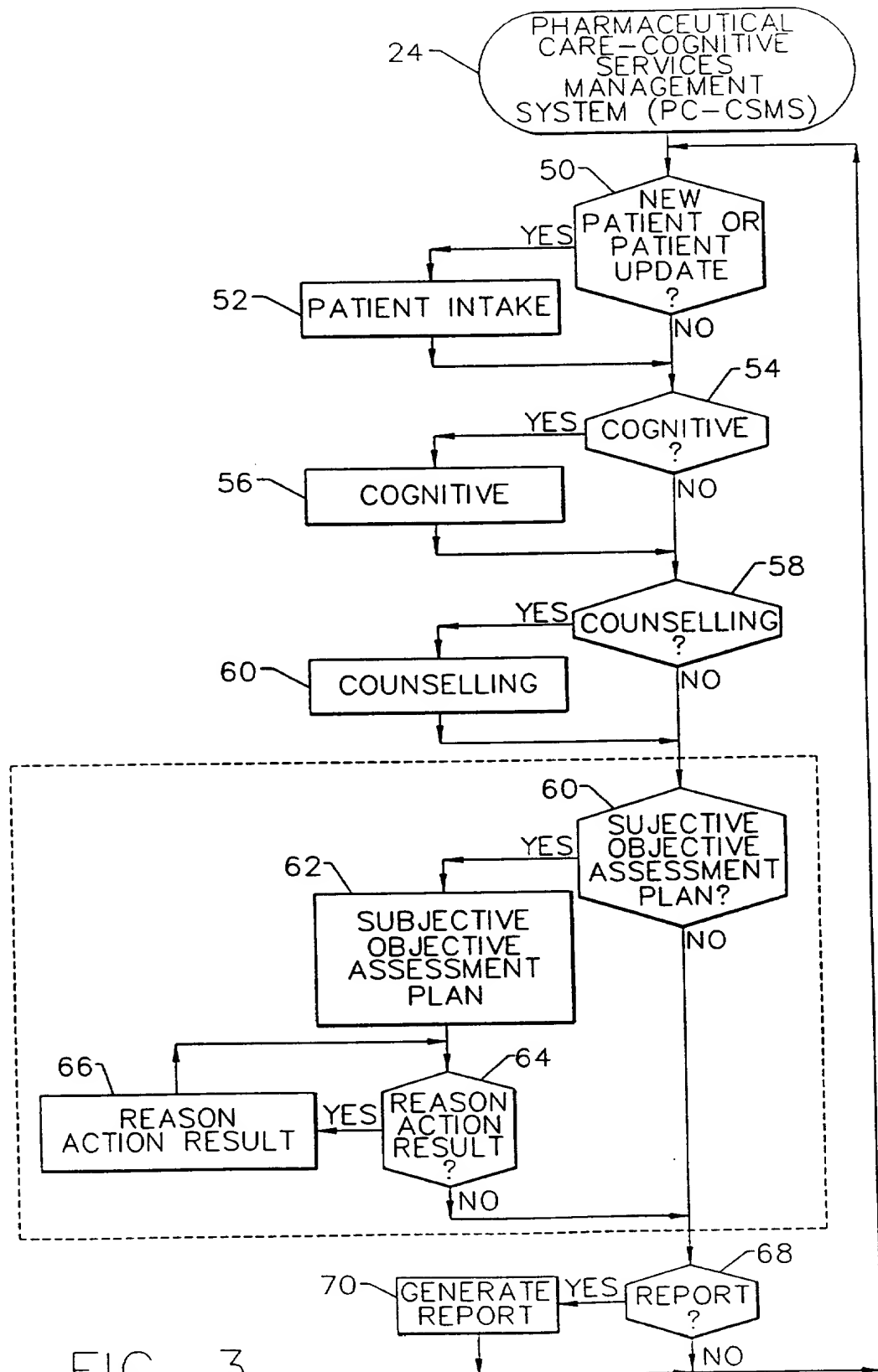


FIG. 3.

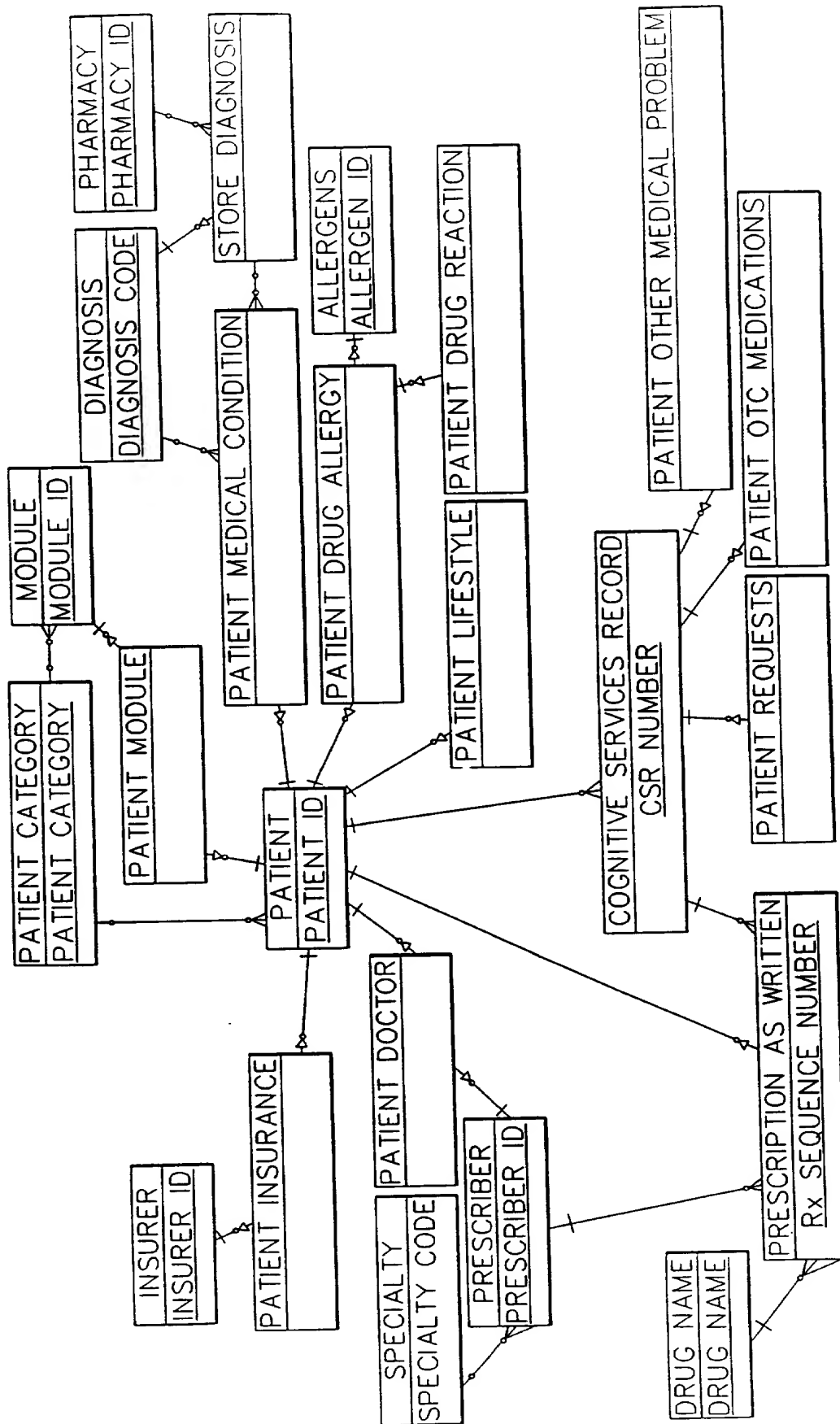


FIG. 4A.

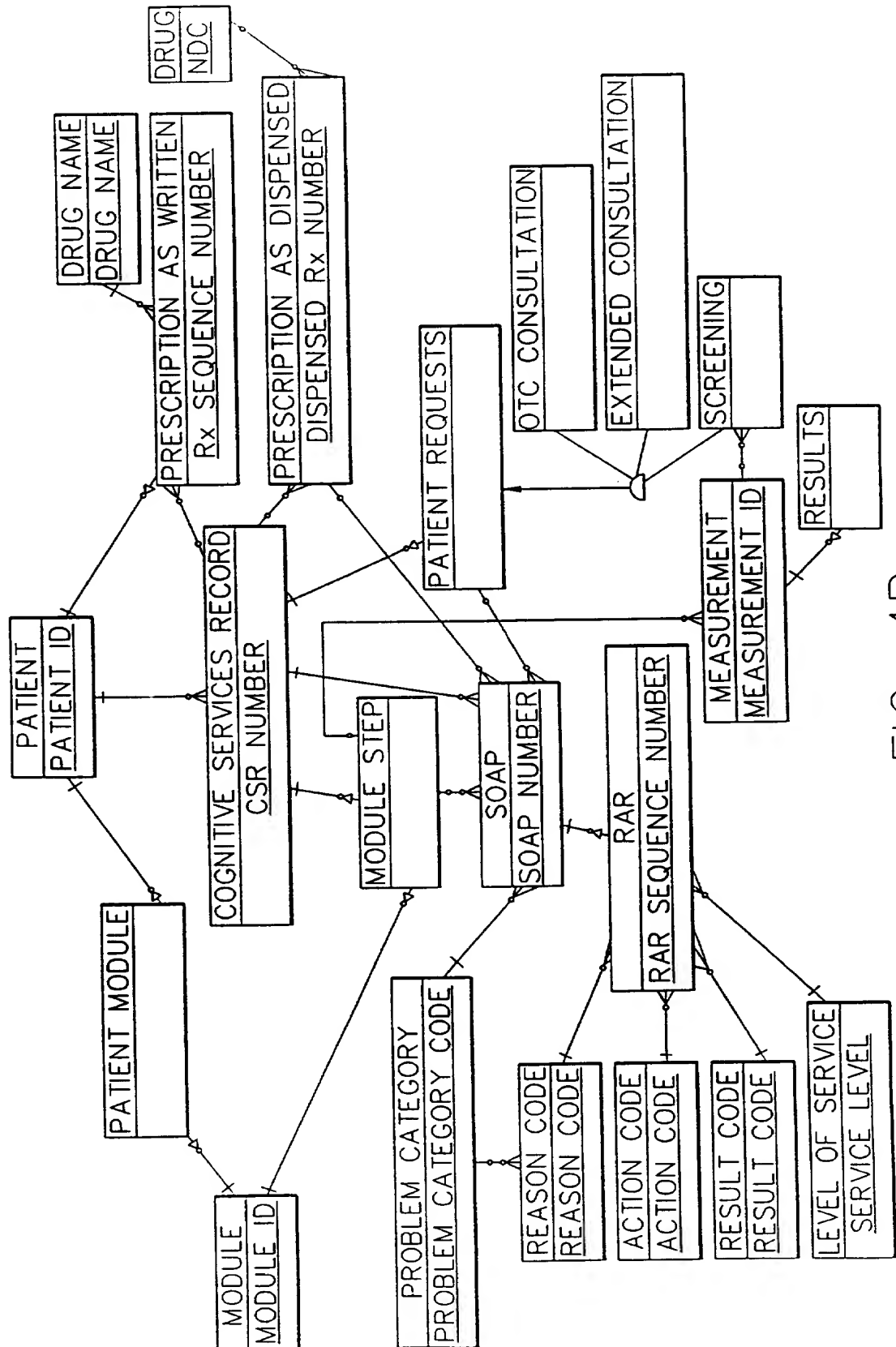


FIG. 4B.

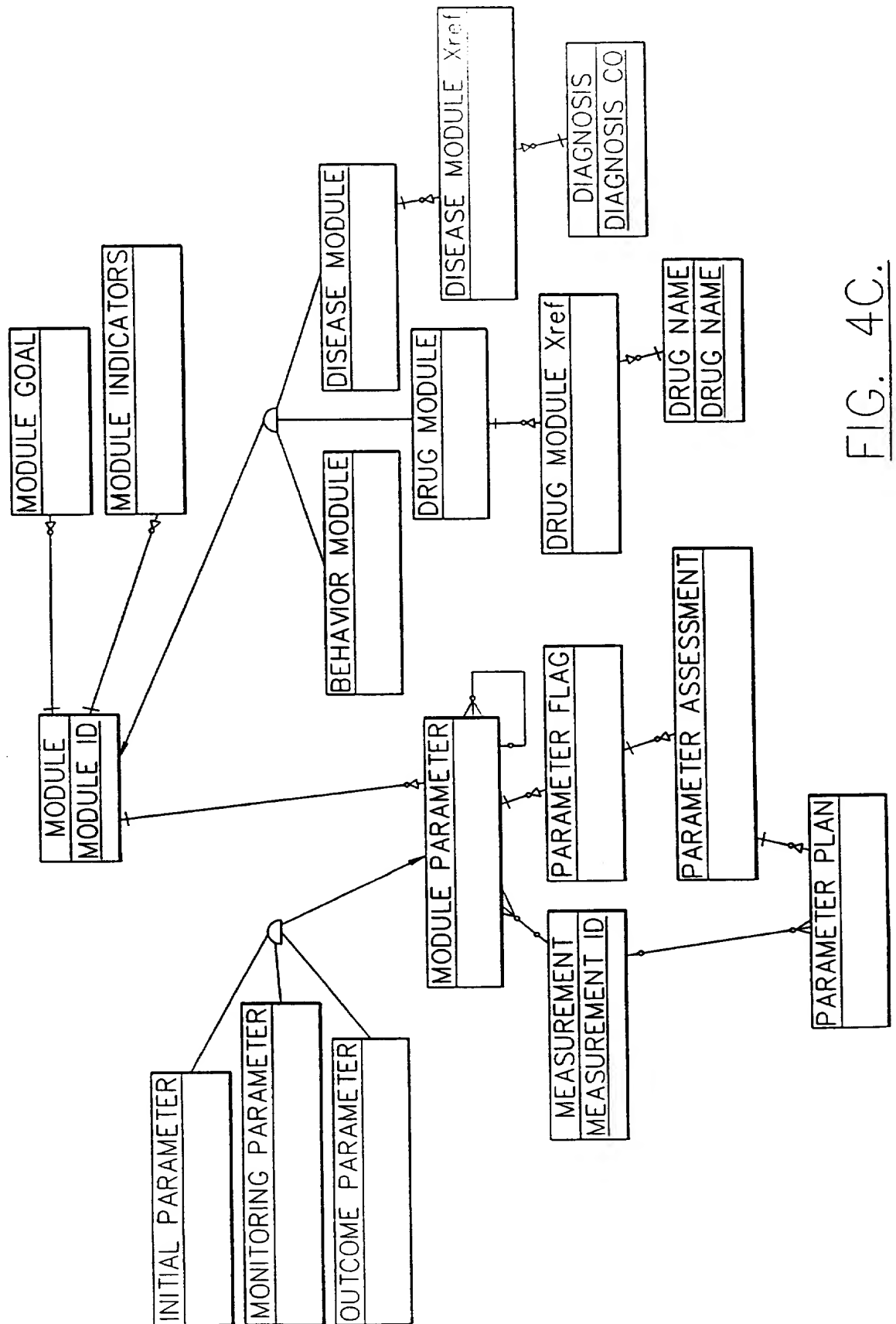
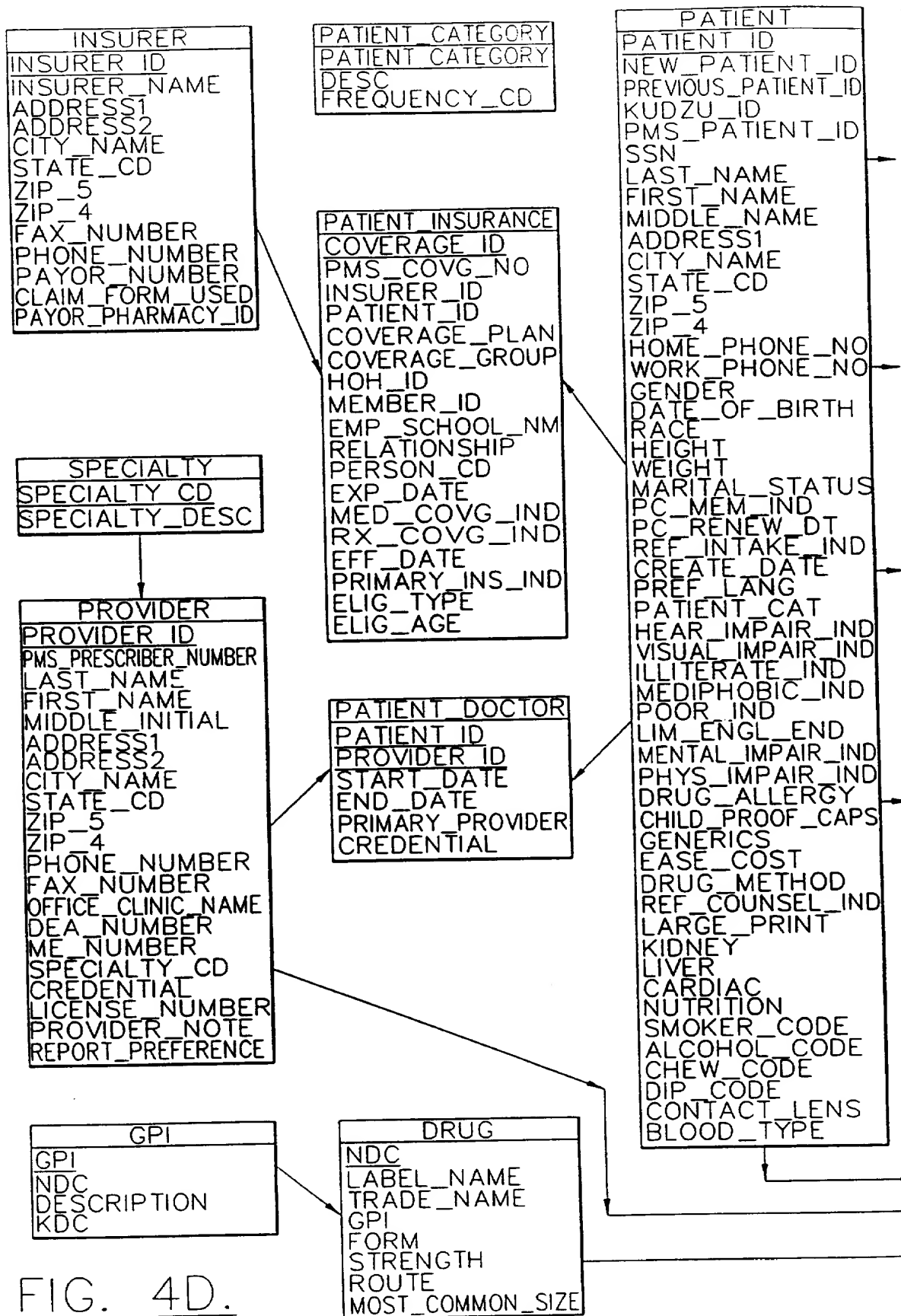


FIG. 4C.

6 /54



TO FIG. 4E.

FIG. 4D.

7 /54

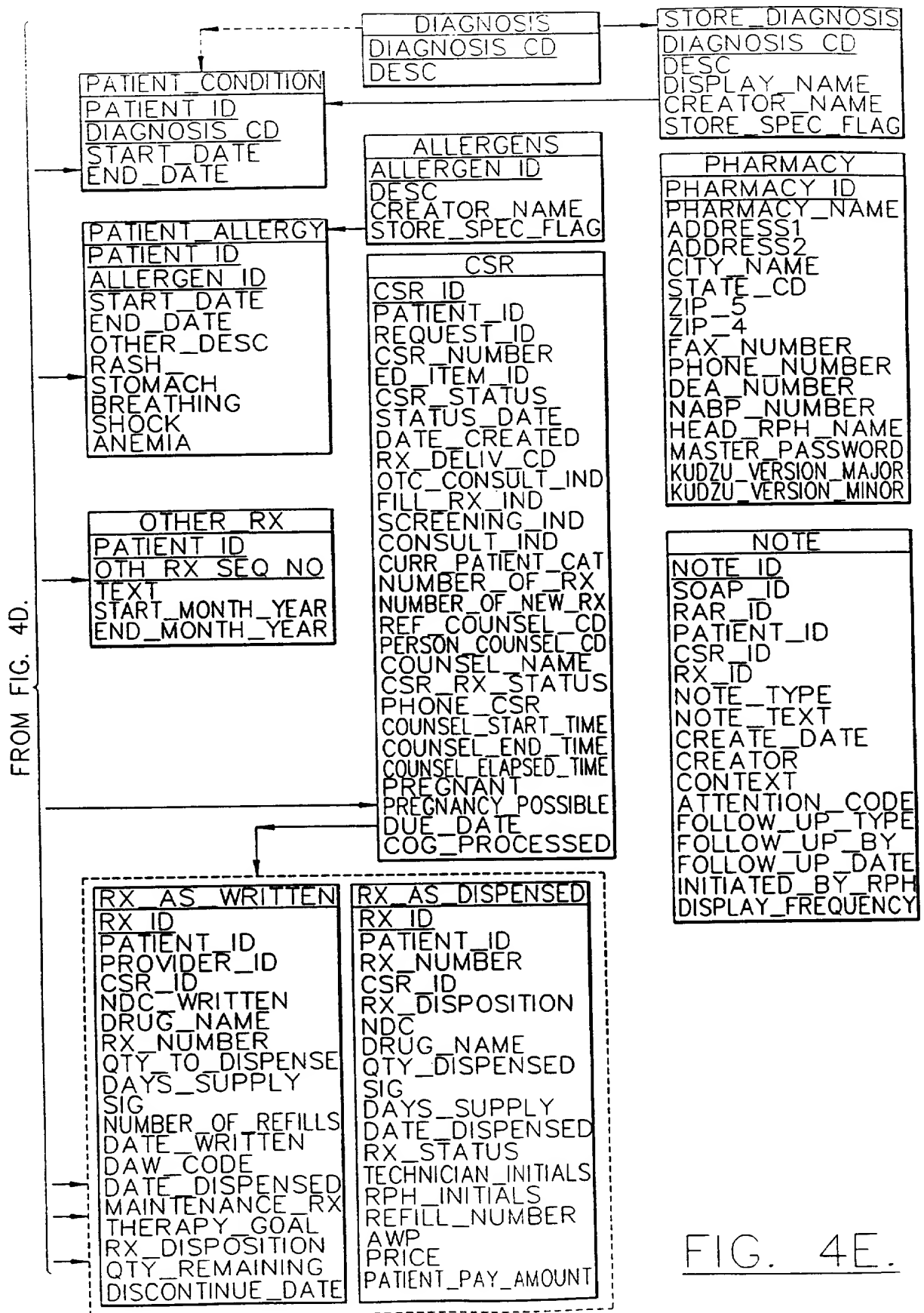
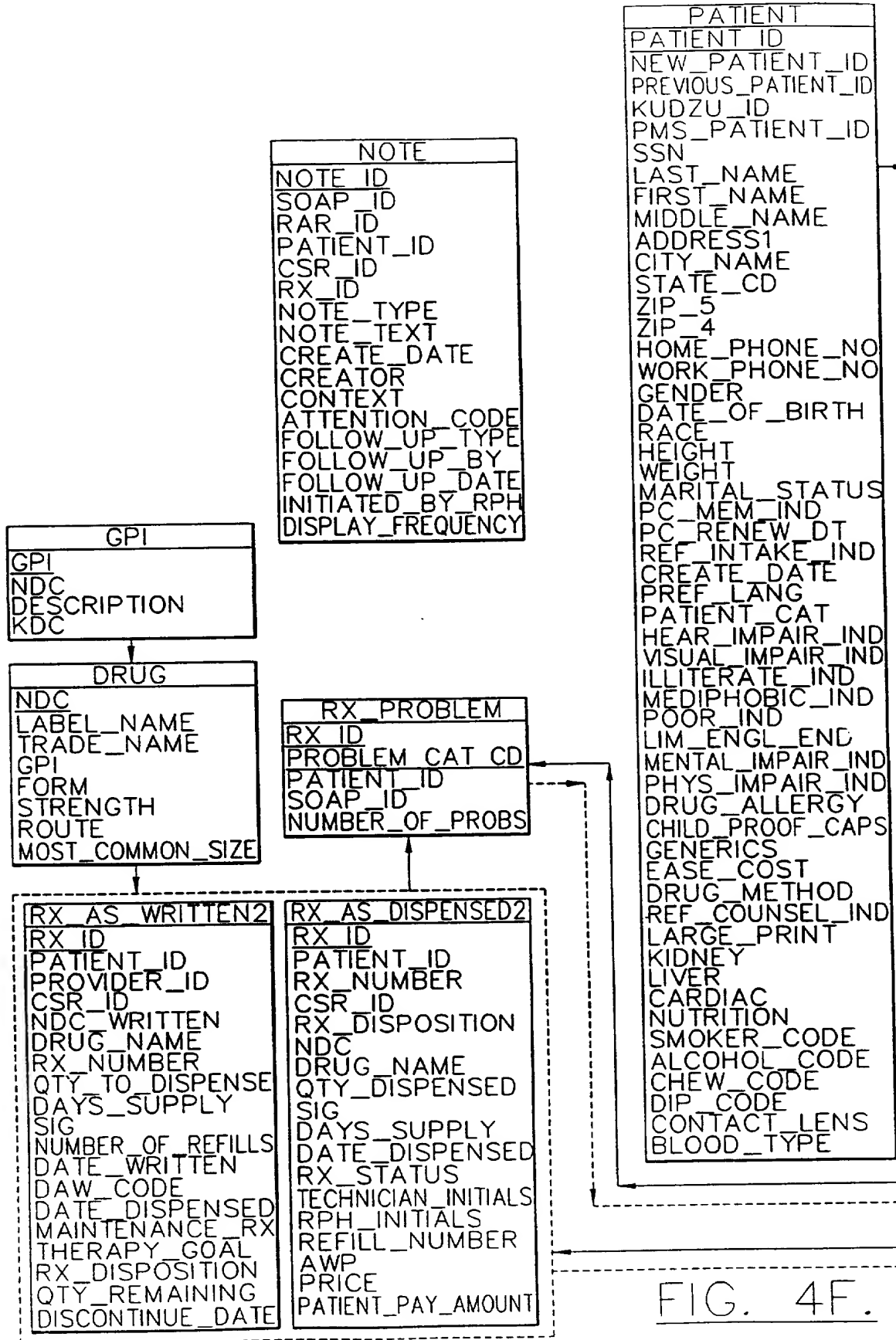
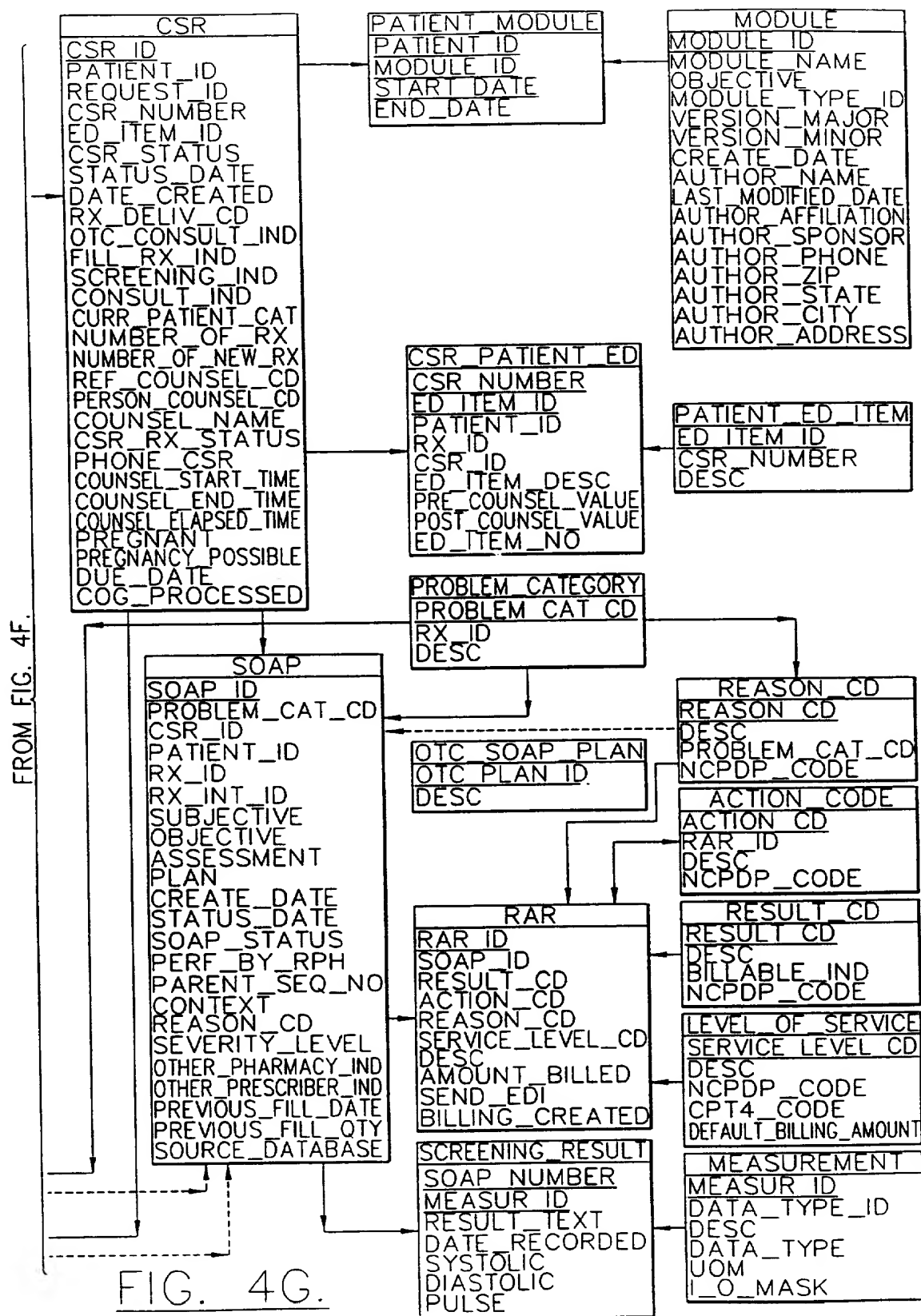


FIG. 4E.



TO FIG. 4G.

FIG. 4F.



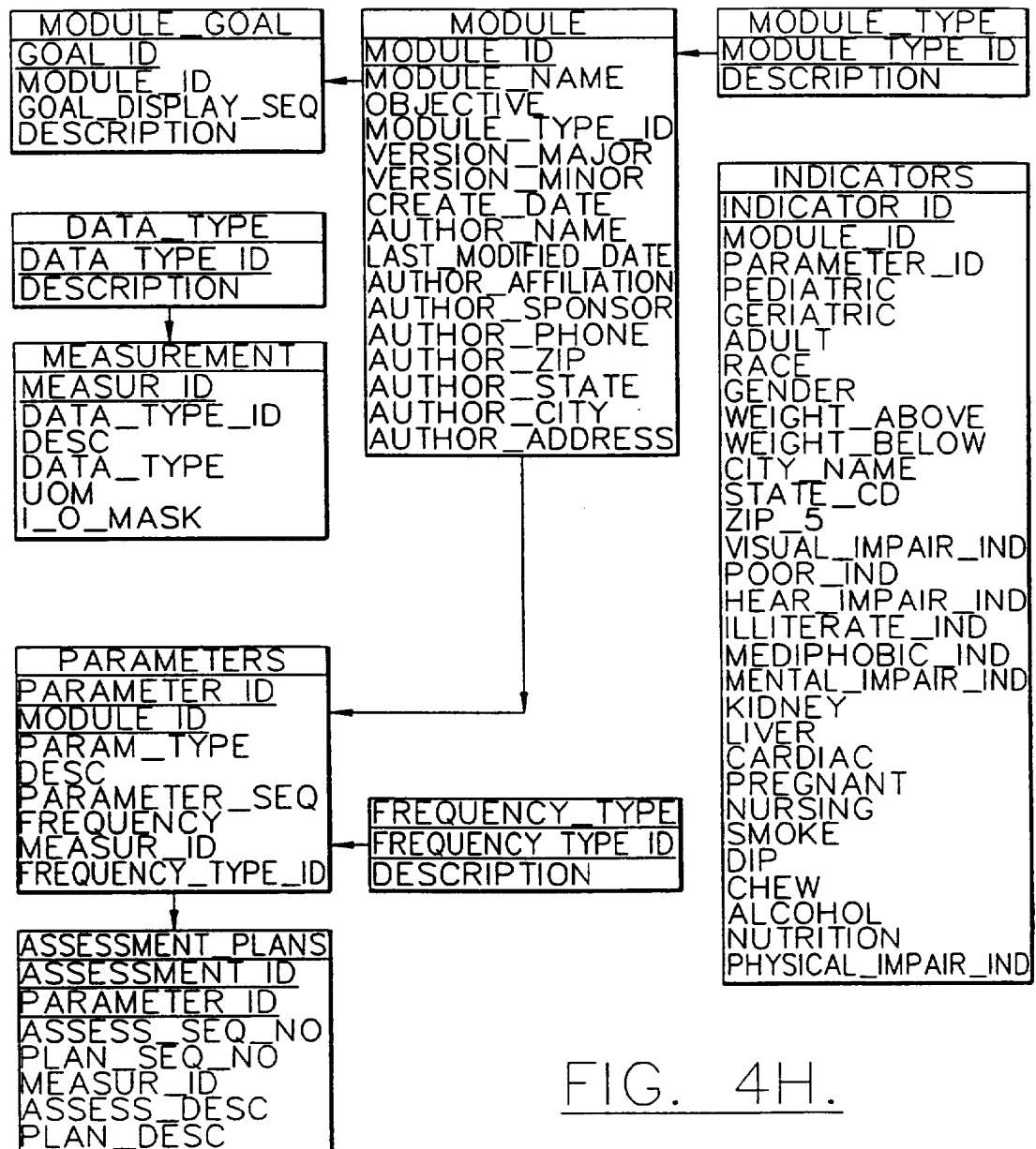


FIG. 4H.

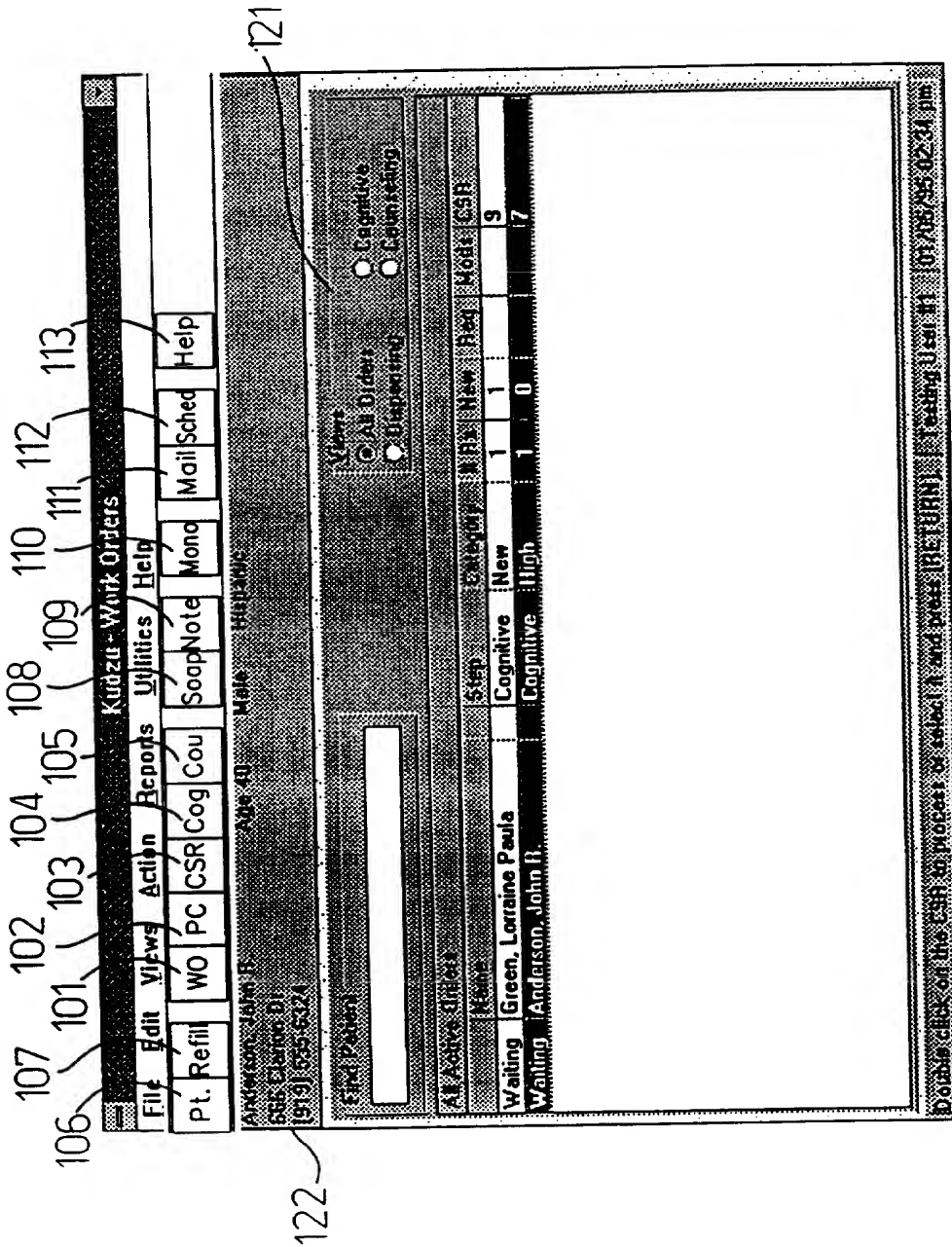


FIGURE 5A

12/54

Kudzu - Patient Chart

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSRI Cog Cou SoapNote Mond Mail Sched Help

Anderson, John R. Age 40 Male Hispanic

666 Clarion Dr
[919] 555-6324

General Insurance Medical Hist. Rx Profile CSR/Hist

Personal Information

Last Name: Anderson First Name: John Middle Name: R. ☐ Refused Initials

Address: 666 Clarion Dr City: Chapel Hill State: NC Zip Code: 27666

Home Phone: [919] 555-6324 Work Phone: [919] 555-6214 Wt. Exp. SSN: 901-88-6214

Demographics

Race: Hispanic Gender: Male

Birth Date: 5/6/54 Height: 5 8 Weight: 190

Preferred Language: Spanish

Kidney Information

☐ Kidney Member

Renewal Date: Patient ID:

Enter the patient's first name

Testing User ID: [012/06/96 02:14 pm]

Done

FIGURE 5B

102

Kudzu - Patient Chart

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mond Mail Sched Help

Anderson, John R. Age 40 Male Hispanic Done

685 Elmwood Dr.
[SIN] 453-6324

General Insurance Medication History Referrals CSR History

Payroll

Envelope Detail
Patient Relationship to Card Holder
☐ Self ☐ Spouse ☐ Child ☐ Other

Card Holder: [Text Box]

Card Holder ID: [Text Box] Member ID: [Text Box] Patient Code: [Text Box]

Plan: [Text Box] Group: [Text Box] Coverage Type: ☐ Medical ☐ Prescription

☐ Primary Coverage for this Patient?

Eligibility Detail: ☐ Family ☐ Individual Effectiveness from: [Text Box] Units: [Text Box] Enroll Effective Date: [Text Box]

Add Remove

141

142

140

Maintain the patient's list of payers here

Testing User #1 07/05/95 02:37 pm

FIGURE 5C

102

Kudzu - Patient Chart

File

Edit

Views

Action

Reports

Utilities

Help

Pt. Refill

WO

PC

CSR

Cog

Cou

Soap

Note

Mon

Sched

Help

Anderson, John R.

Age 40

Male

Hispanic

Done

655 Elm St B

(919) 455-5324

General

Insurance

Medical

Prescriptions

Referrals

CSR History

Medical Conditions

☐ Anemia
☐ Angina
☐ Arthritis
☐ Asthma
☐ Blood Clotting
☐ Blood Pressure, High

Other Diagnosis

Immunizations

☐ Measles
☐ Mumps
☐ Polio
☐ Tetanus

Blood Type

A

Prescriptions

Name

Pr

☒ Helms, Jessica Leigh, MD
☐ Flores, Humberto Juan, MD

Add

Remove

Drug Allergies

☐ Aspirin
☐ Barbiturates
☐ Cephalosporins
☒ Codeine
☐ Demerol

Other Allergy

Skin Rash

☐

Difficulty Breathing

☐

Stomach Intolerance

☐

Shock

☐

Abnormal

☐

Other

☐

145

146

Blood Type of the pt

Testing Unit: H

01/05/95 02:37 pm

FIGURE 5D

102

Kudzu - Patient Chart

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou Soap Note Mono Mail Sched Help

Anderson, John R. Age 40 Male Hispanic

686 Clinton Dr.
(919) 555-5324

Done

125

General Insurance Medical Misc Rx Profile CSR History

☒ Child Resistant Packaging

☐ Generic Drugs When Possible

☐ Print Large Labels

Medication Selection Priority

☐ Bill ☐ Cost ☐ No Preference

Preferred Therapy

☐ Drug ☐ Non-Drug ☐ No Preference

Observations

☐ Meds/Habits ☐ Illiterate ☐ Role

☐ Limited English

Lifestyle

Alcohol Use

☐ Wears Contact Lenses

Tobacco Use

Smoke

Chew

Dis

Check if the patient wants child resistant packaging

Testing User ID: 01/05/95 02:38 pm

FIGURE 5E

102

Kudzu - Patient Chart

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mond Mail Sched Help

Anderson, John R Age 40 Male Hispanic

555 Clanton Dr
[919] 459-6324

125

General Insurance Medical Notes Rx Profile CSR History

Date	Rx #	Drug	Dly	Refill	Practitioner	RPh	Tech
12/21/94		SEAMBUROZIL 60MG	30	1	Flores, Humberto		
12/21/94		CALAN 120MG TABS	60	1	Flores, Humberto		
12/21/94		BENFIBROZIL 60MG	30	0	Flores, Humberto		
12/21/94		CALAN 120MG TABS	60	0	Flores, Humberto		

This tab displays the patient's prescription history

Testing User #1 01/05/95 02:39 PM

FIGURE 5F

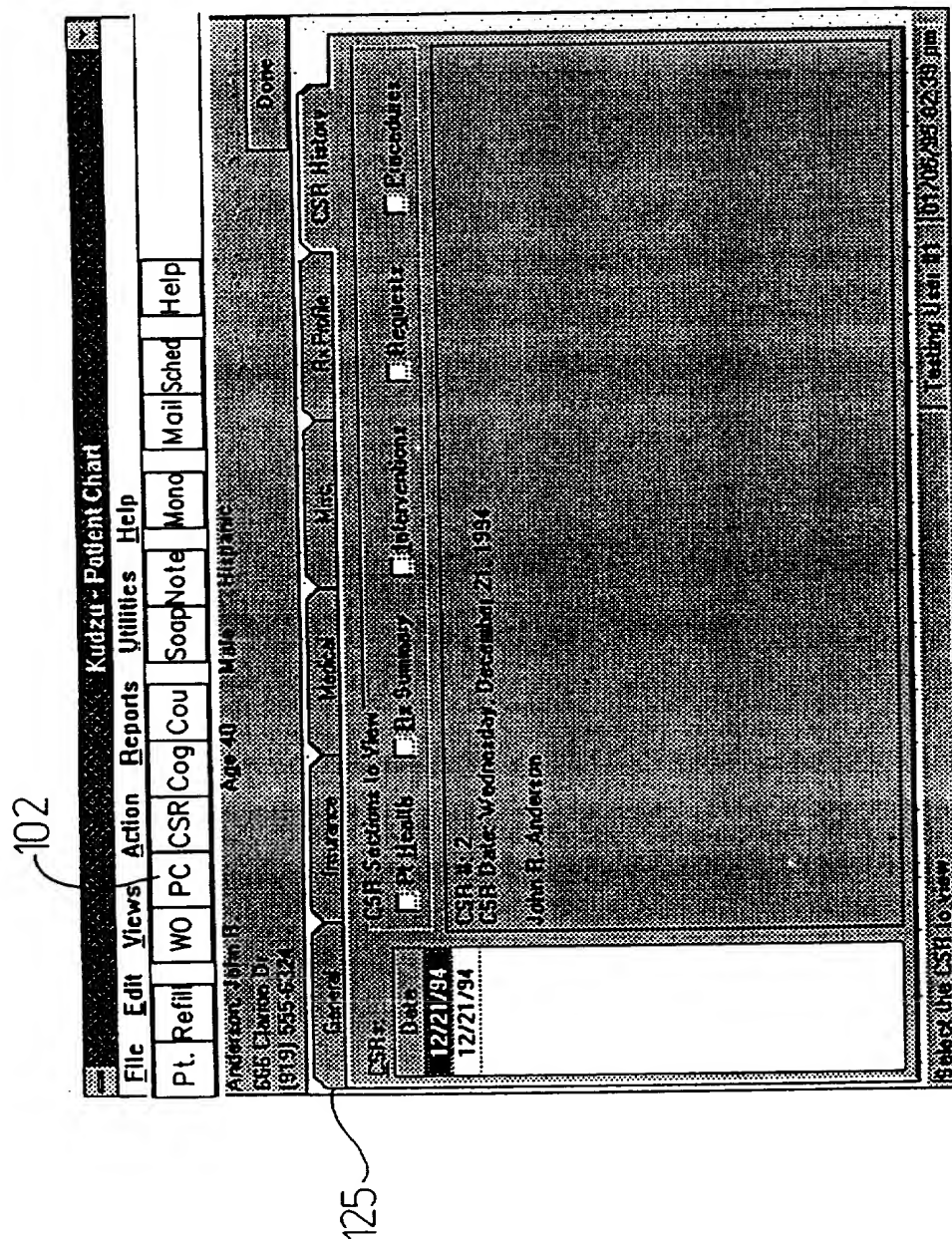


FIGURE 5G

18/54

Kudzu - CSR Intake

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Monc Mail Sched Help

Anderson, JHBR Age 40 456 10/15/95

555 Clancy Dr
9191 555 5324

181

182

183 184

185

103

Refill	Drug	Quantity
0000018	ACE TAMINOPHEN	120
123575	CALAN 120MG TABS	300
123576	GEMFIBROZIL	60

Extended Consultation Requests

None at this time

Extended Procedure Requests

☒ Blood Pressure

☐ Pulse Rate

☐ Blood Sugar

☐ Weight

☐ Height

Needs help select cough med.

Check the patient's screening/procedure requests

10/15/95 01:15 PM

FIGURE 5H

19/54

103

Kudzu - CSR Intake

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mond Mail Sched Help

Anderson, John R. Age 40 Male Hispanic Done

566 Clanton Dr.
9131 535-5324

181

191

192

193

194

FIGURE 51

Kudzu - CSR Intake

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mono Mail Sched Help

Anderson, John R. Age: 40 Male Hispanic

5516 Elarton Dr
(919) 555-6324

181

103

Basic Patient Information

John R. Anderson SSN: 901-88-6214
DOB: 01/01/56
5516 Elarton Dr Raleigh, NC 27605
Home Phone: (919) 555-6324 Work Phone: (919) 555-6324

Race: Hispanic Preferred Language: Spanish
Patient Category: High Blood Type: A+

Impairment: Physically Impaired
Prescription Preferences: Child Proof Caps
Preferred Pharmacy: No Preference
Medication Selection Priority: NB Preference

Physician: Dr. James L. Smith, MD
Physician Number: 031001-1234

Drug Allergy: Codeine
Medical Conditions:

Testing User: J1 01/01/96 02:41 pm

Basic Patient Information

Done

FIGURE 5J

104

211

Kudzu - Cognitive

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mond Mail Sched Help

Anderson, John B. Age 40 Male Hispanic

6516 Elarado Dr
(913) 655-6324

Encounter Review Standard of Care Interpretation Rx Summary

Current Requests
Drug **GEMFIBROZIL 600MG TABS** Refill

Screening / Probation Requests

OTC Consultation Requests

Extended Consultation Requests

Other Information
Other Rx

OTC Medications

Reported Problems

Miscellaneous

This is the list of this pt's Rx requests (not achievable)

Testing User ID: 01/05/96 02:42 pm

Done

FIGURE 5K

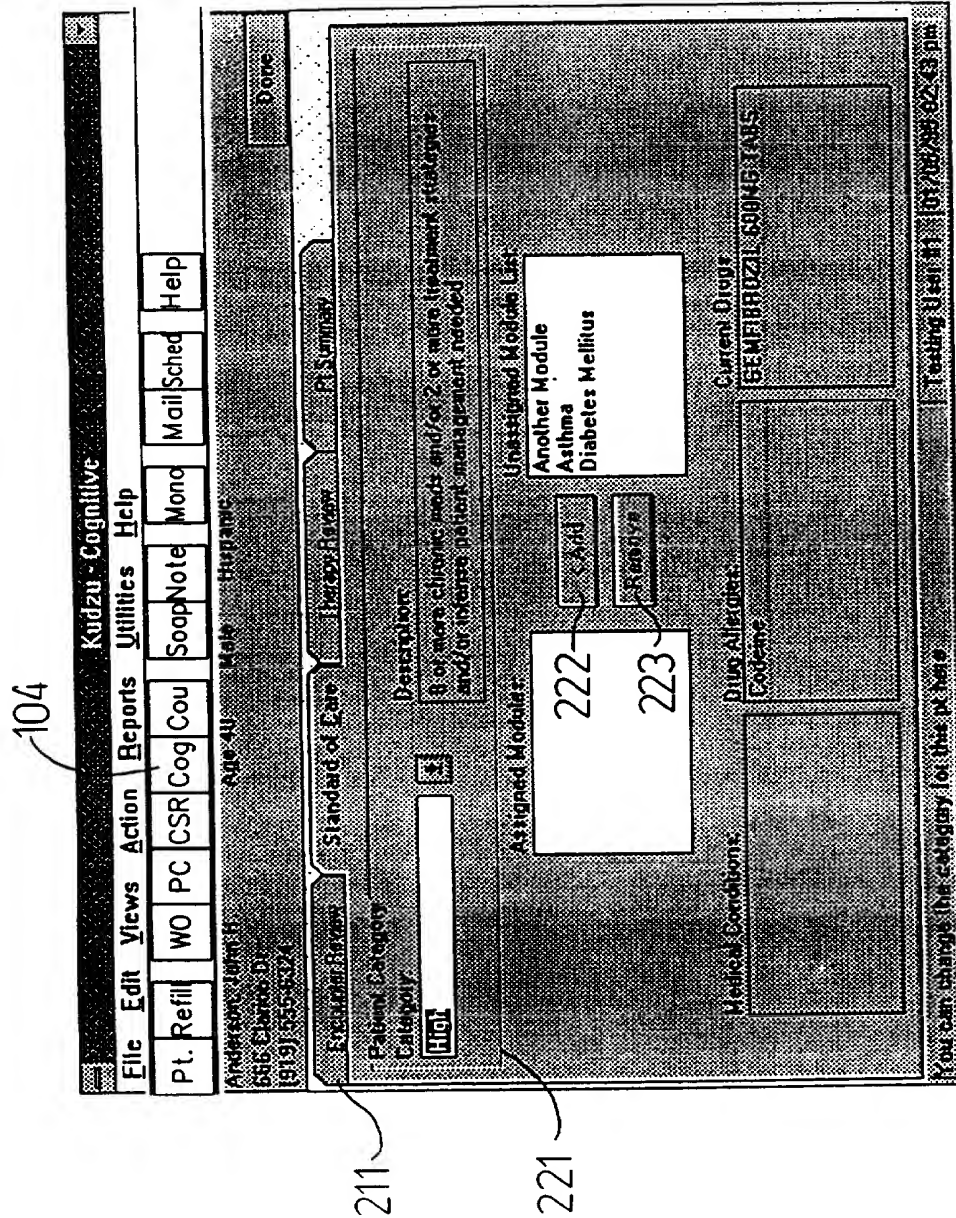


FIGURE 5L

Kudzu - Cognitive

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mono Mail Sched Help

Anderson, 3812-91 Age: 60 Male Hispanic Done

595 Clifton Dr

8791555-6324

Prescription History Standard of Care

Rx # Drug

Done 0000022 COCAINE HCL 4% SOLN

Prescription Information

COCAINE HCL 4% SOLN

Quantity: 30 Days: 30 Initiations

Therapy Goal

Therapy Review

Prescription

Problem Category

Drug-Drug

Drug-Food

Lifestyle

Drug-Allergy

Drug-Disease

Patient

Compliance

Flags

Drug-Drug Information

Drug-Drug Details

Displayed information applies to Rx selected here

11/16/95 12:41 pm

Killing User *

FIGURE 5M

Kudzu - Cognitive

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mono Mail Sched Help

Anderson, John H. Age 40 Male Hispanic Done

686 Elmore Dr
(919) 555-5324

Encounter Patient Standard of Care Therapy/Referral Pt Summary

Basic Patient Information

John R. Anderson SSN: 901-88-5214
686 Elmore Dr Date of Birth: 5/8/54
Shapel Hill NC 27565 Height: 5'8" Weight: 180 lbs
Home Phone: (919) 555-5324 Work Phone: (919) 555-5314

Race: Hispanic Preferred Language: Spanish
Patient Category: High Blood Type: A+

Impairment:
Physically Impaired

Prescription Preferences:
Child Proof Cap

Preferred Therapy: No Preference
Medication Selection Priority: No Preference

Physicians:
Helms/Jackson Lehigh, MD
Hines/Humberto Juan, MD

Drug Allergies:
Codeine

Medical Conditions:

Summary of Patient Information (not editable here) Testing Used: 01/209/209 602 (5 min)

FIGURE 5N

105

Kudzu - Counseling

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mono Mail Sched Help

Anderson, John R Age 40 Male Hispanic Done

666 Clinton Dr
931 91 535-4324

Therapy Monitor Standards Care Immunizations Counseling

Prescription Information
COCAINE HCL EXSTEN
Quantity 20 Days 28 Initial Date

Done 0000022 COCAINE HCL 4% SOLN
Prescription

PL Education Before After

Understands Drug ☒ ☒

How Drug Works/Onset ☒ ☒

How to Properly Take Drug ☒ ☒

What to Avoid ☒ ☒

What Followup Is ☒ ☒

SE and What Not to Report ☒ ☒

PL Compliance
Patient commitment to therapy compliance
Before: ☒ Yes ☒ No After: ☒ Yes ☒ No

PL Questions
Does patient have any questions about his drug? ☒ Enter Question

6 months run another allergy test

Loading 3BAP/RAR form and information. Printing User ID: 00000225 03:03 am

251

FIGURE 50

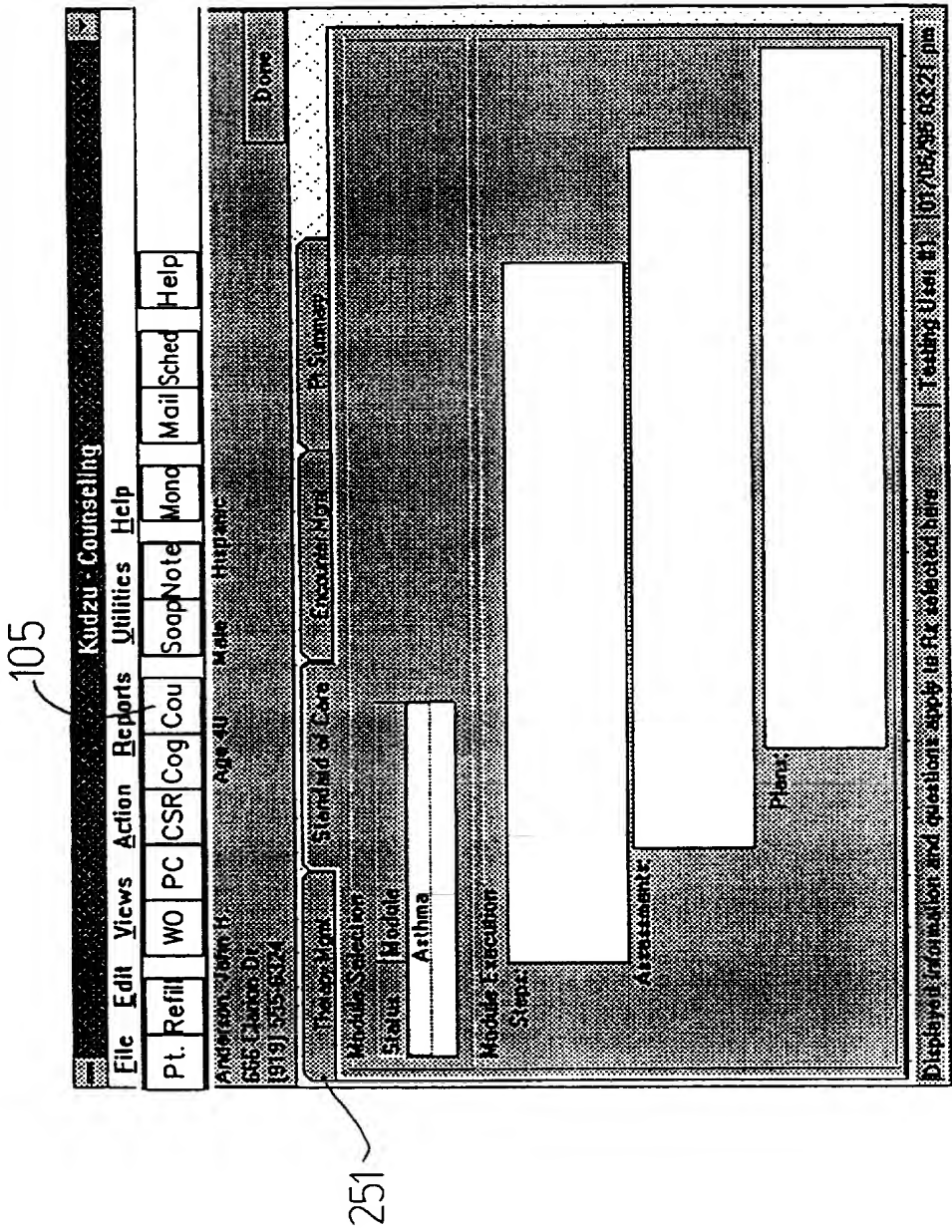


FIGURE 5P

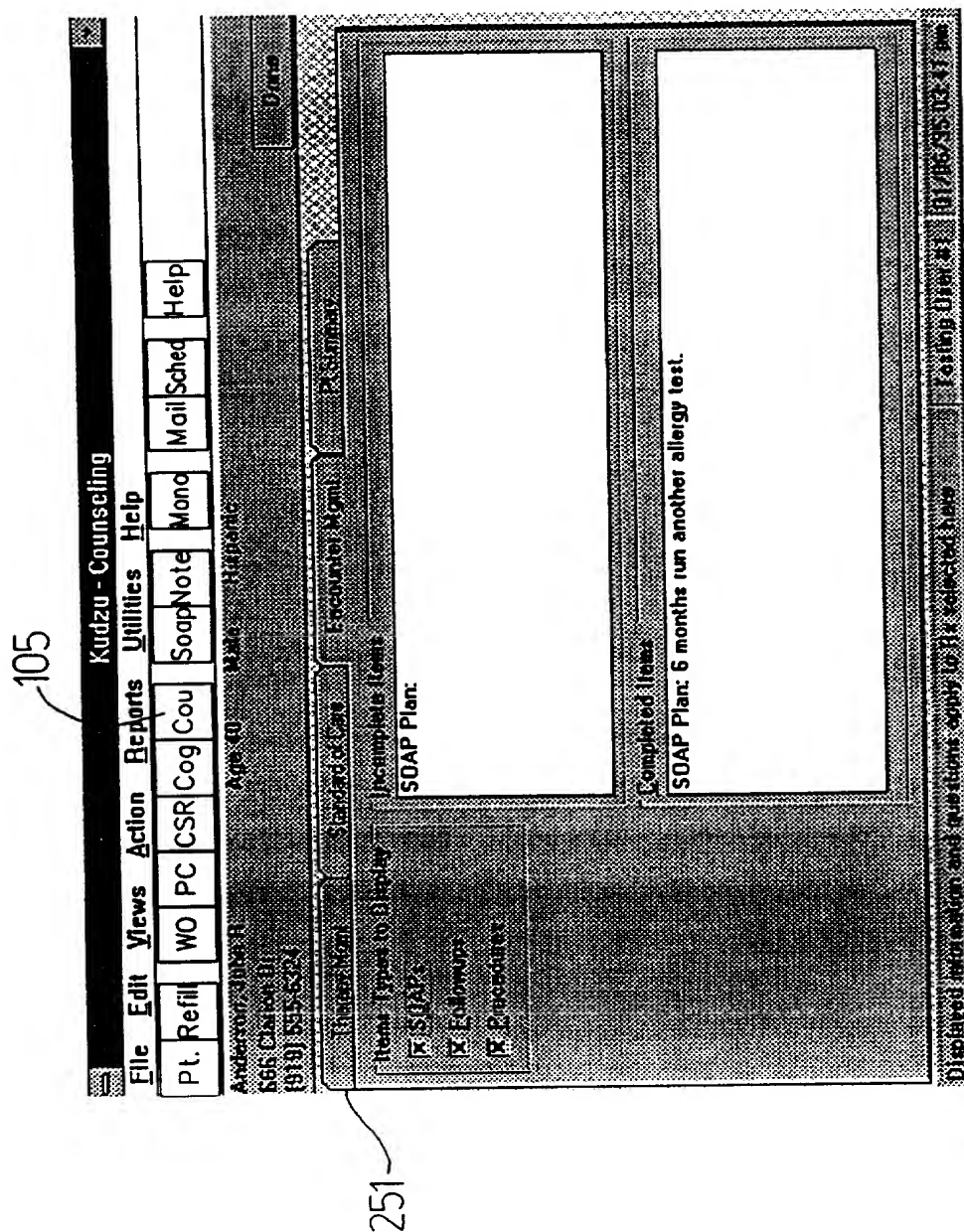


FIGURE 5Q

Kudzu - Counseling

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mono Mail Sched Help

Anderson, John R. Age 40 Male Hispanic

685 Clarino Dr
(919) 555-5324

251

205

Basic Patient Information

John R. Anderson
685 Clarino Dr
Chapel Hill, NC 27516
Home Phone: (919) 555-5324 Work Phone: (919) 555-6214

SSN: 901-89-6214
Date of Birth: 5/8/54
Height: 5'8" Weight: 180 lbs

Race: Hispanic Preferred Language: Spanish
Patient Category: High Blood Type: A-

Impairment:
Physically Impaired

Prescription Preferences:
Chai Pain Caps

Preferred Therapy: No Preference
Medication Selection Priority: No Preference

Physicians

Robert, Patricia Esq., MD
Robert, Humberto Esq., MD

Allergies:
Erythema

Medical Conditions

Displayed information and questions apply to Rx collected here

Testing User: 11 01/06/96 03:22 pm

Done

FIGURE 5R

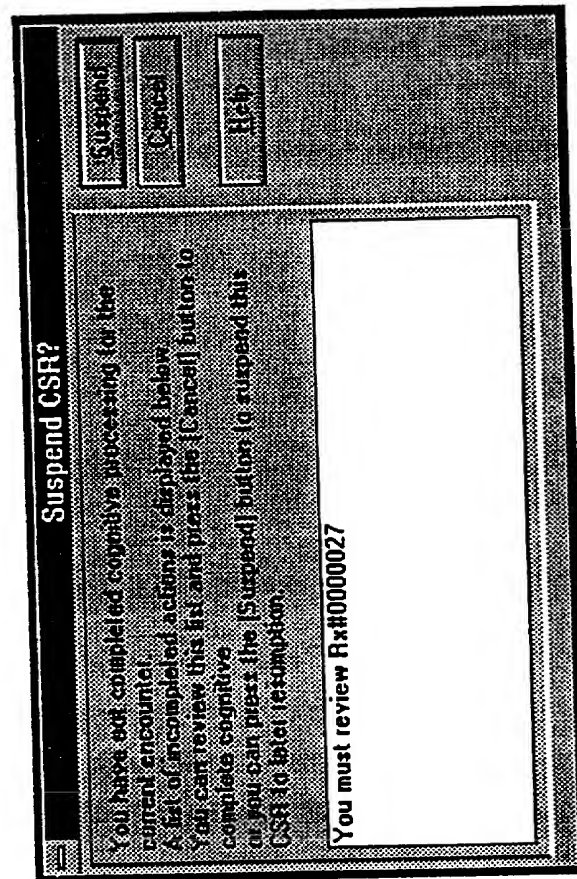


FIGURE 5S

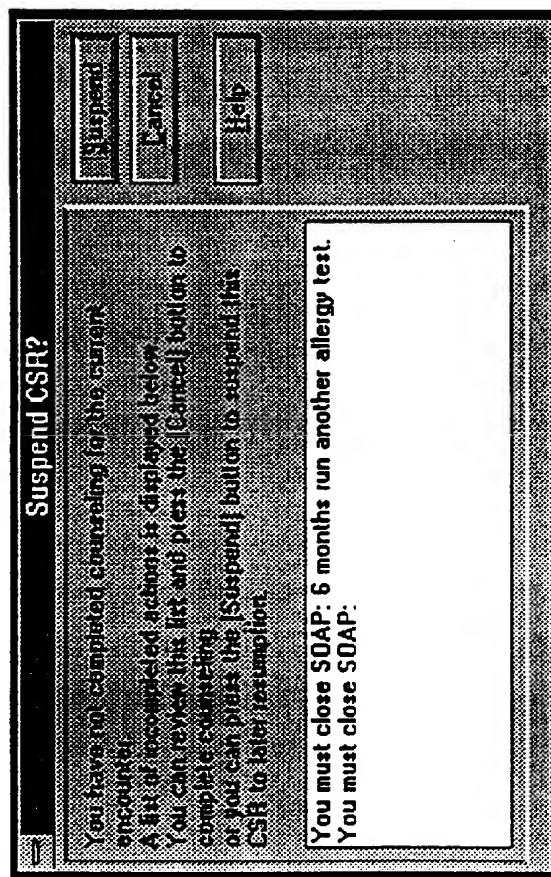


FIGURE 5T

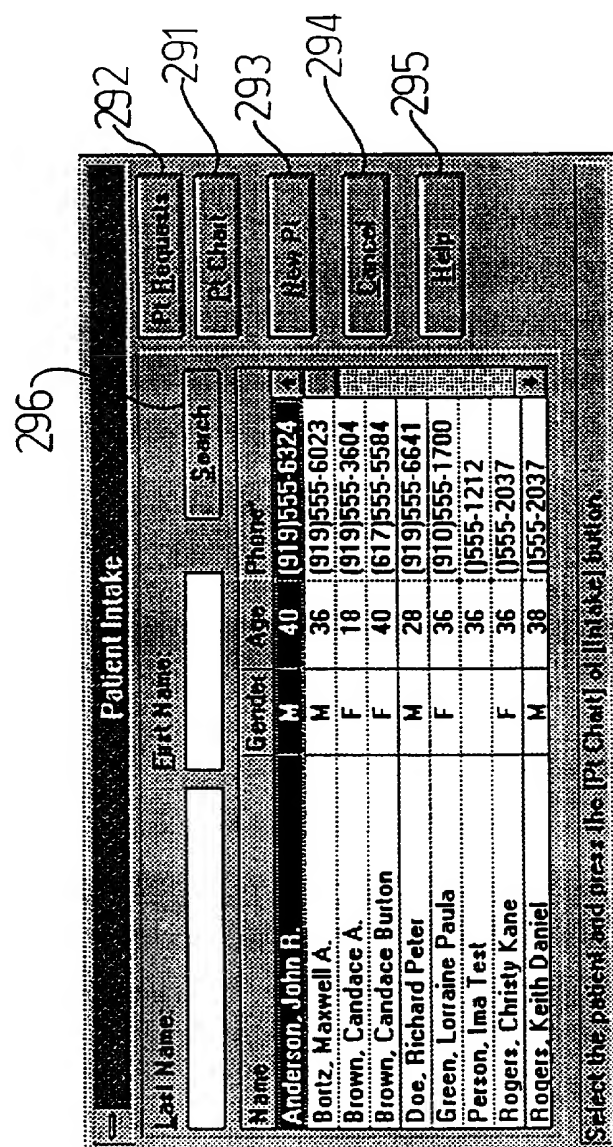


FIGURE 5U

The image shows a graphical user interface window titled "Refill Rx". The window has a title bar at the top. Below the title bar, there is a central area with a large text box. To the left of the text box, there is a label "Rx #:" followed by a small rectangular input field. Below the input field, the text "Rx Information" is displayed. The large text box contains the message "This space blank until valid Rx # entered". At the bottom of the window, there are four buttons: "Refill", "End Rx", "Cancel", and "Help". The buttons are arranged horizontally. The window has a standard Windows-style border.

301

302

303

304

Refill Rx

Rx #:

Rx Information

This space blank until valid Rx # entered

Refill

End Rx

Cancel

Help

Enter the RX number to be refilled

FIGURE 5V

33/54

357

SOAPs and RARs

SOAP RAR

Context: CSR

Subjective: Before counseling pt does not understand drug

Objective: Cefitin TAB 125 mg

Assessment: General health problems

Plan: Talk to doctor about health issues

Procedure: Blood Pressure

Enter the plan for resolving this problem.

351 353 352 354 355 356

OK Cancel Submit Add RAR Delete RAR Help

FIGURE 5W

SOAPs and RARs

SOAP

RAR

Reason:
Adverse drug reaction

Action:
Generic product selection

Result:
Discontinued drug

Intervention:
Level 1 - Straightforward, or less than 5 minutes

Ampt to Bld:
10.00

Description:

370

Procedure:
Blood Sugar

Material:

367

Performs Procedure

Add

Edit

Delete

Select the service level for this intervention.

OK

Cancel

Suspend

Add RAR

Delete RAR

Help

FIGURE 5X

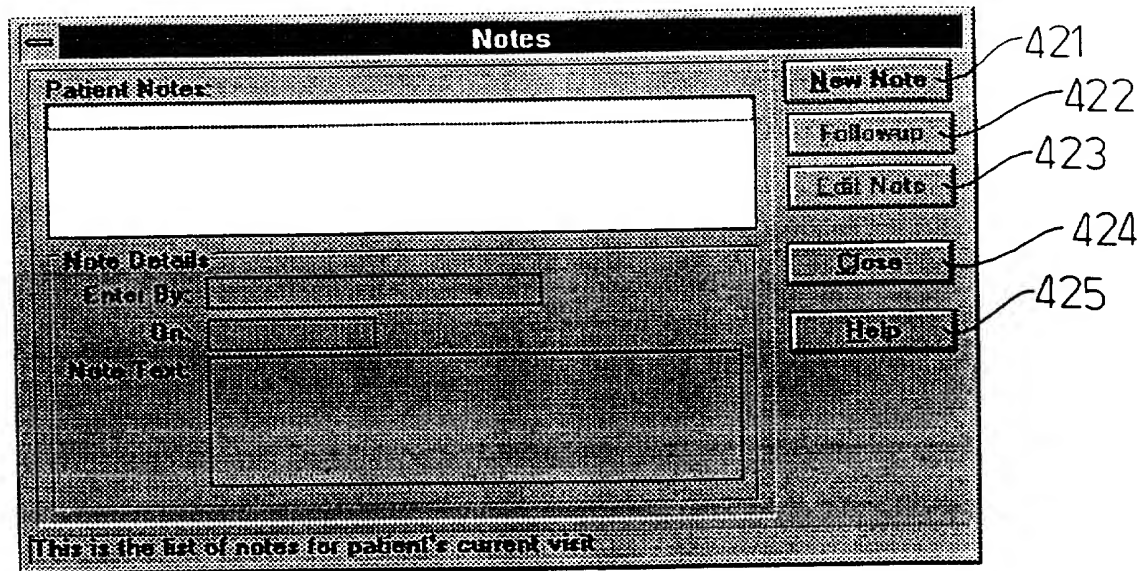


FIGURE 5Y

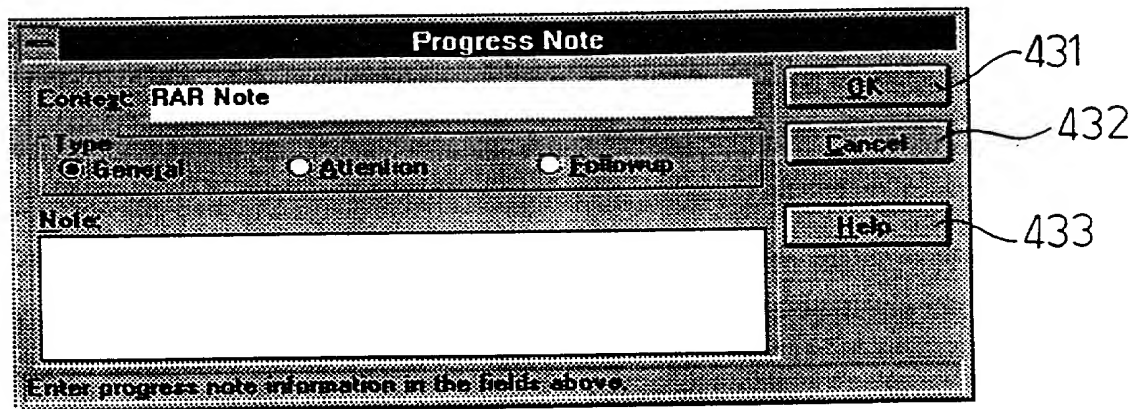
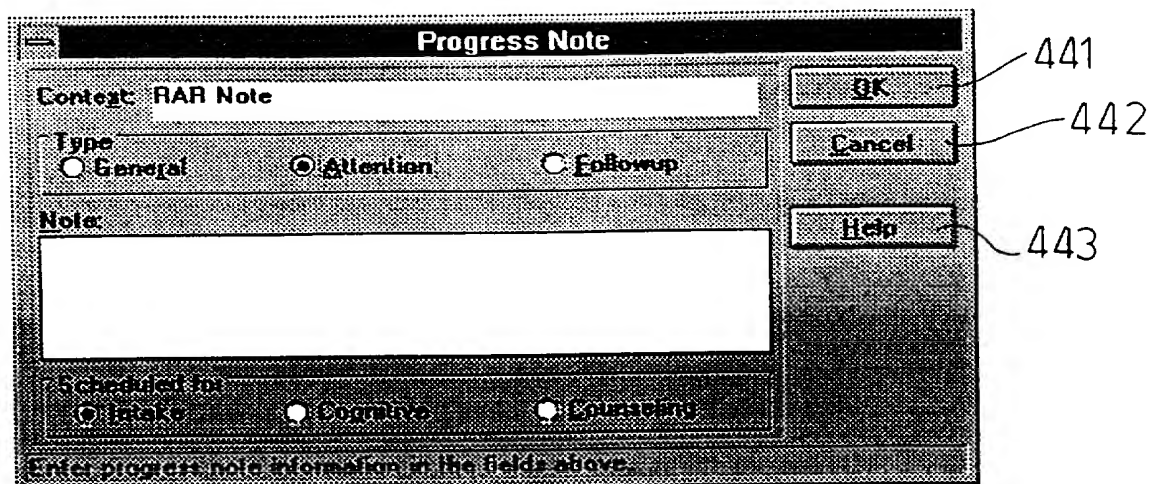


Figure 5Z

36 /54



Progress Note

Context: RAR Note

Type

☐ General ☒ Attention ☐ Followup

Note:

Scheduled for

☒ Intake ☐ Cognitive ☐ Counseling

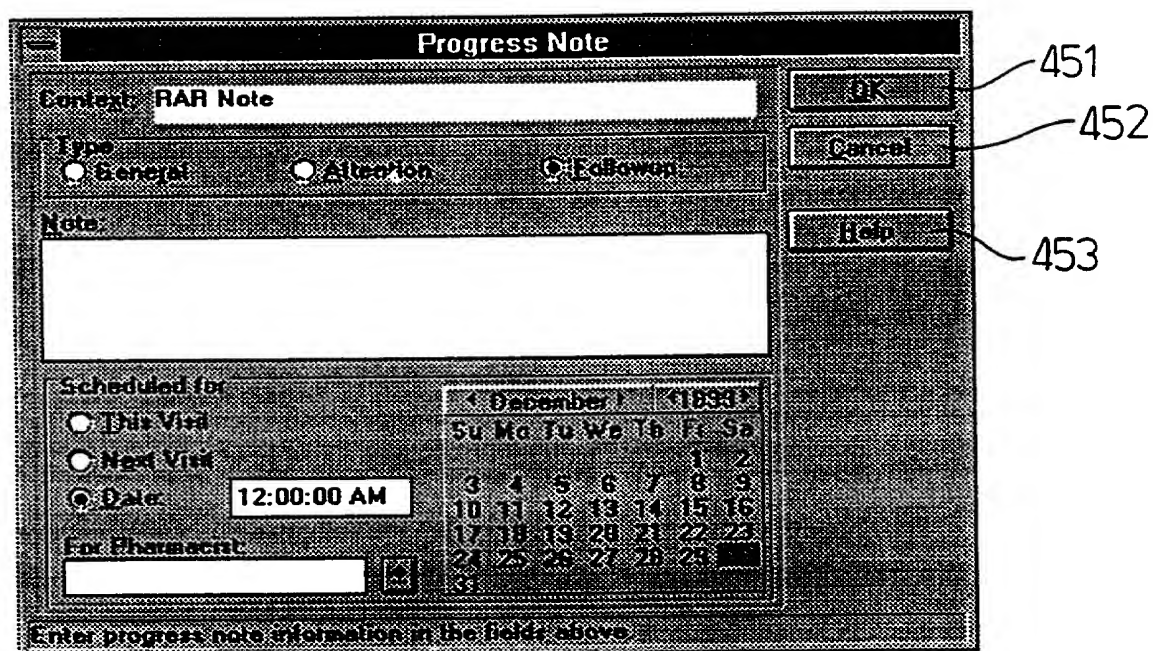
OK 441

Cancel 442

Help 443

Enter progress note information in the fields above.

FIGURE 5AA



Progress Note

Context: RAR Note

Type

☐ General ☐ Attention ☒ Followup

Note:

Scheduled for

☐ This Visit ☐ Next Visit ☒ Date:

12:00:00 AM

For Pharmacist:

OK 451

Cancel 452

Help 453

Enter progress note information in the fields above.

December 1993						
Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

FIGURE 5BB

SOAPs and RARs

SOAP

Subjective:
 Believe patient drinks heavily

Objective:
 Bloodshot eyes, smells of liquor at 11:00 am

Assessment:
 Possible complications with therapy, general health problem

Plan:
 Talk to patient about complications with therapy, talk to doctor about health issues

Procedure: None

Enter the plan for resolving this problem

Buttons:
 Add (351), Cancel (353), Suspend (352), Add RAR (354), Delete RAR (355), Help (356)

FIGURE 5CC

SOAPs and RARs

SOAP

RAR

RAR2

361

363

362

364

365

366

Reason

Alcohol precaution

Action

Patient education/instruction

Result

Drug therapy unchanged

Intervention

Level 2 - Low Complexity, or less than 15 minutes

Am to RAR

20.00

Description

Patient was not forthcoming about this; still concerned

Procedure

None

Perform Procedure

Notes

367

Add

Edit

Delete

Select the reason for this intervention

OK

Cancel

Suspend

Add RAR

Delete RAR

Help

FIGURE 5DD

SOAPs and RARs

SOAP RAR RAR 2

Reason:

Actions:

Results:

Intervention: Amt to Bill:

Description:

Procedure:

Notes:

Enter any other information you want recorded for this intervention.

FIGURE 5EE

FIGURE 5FF

296

Patient Intake

292

291

293

294

295

Last Name:

First Name:

Search

Name:

Gender: Age: Phone:

FIGURE 5GG

296

Patient Intake

Last Name: First Name: Search:

Name	Gender	Age	Phone
Rogers, Christy Kane	F	36	(1)555-2037
Rogers, Keith Daniel	M	38	(1)555-2037
Rogers, Kimberly Anne	F	8	(919)555-2037

Select the patient and press the [F] Chat of Intake Button

FIGURE 5HH

296

Patient Intake

Last Name: **ROGERS** First Name: **CHRISTY** Search

Room: **Rogers, Christy Kane** Gender: **F** Age: **36** Phone: **(0555-2037**

292 291 293 294 295

Pt Request Pt Order New Pt Cancel Print

Select the patient and press the [Pt Chart] or [Intake] button.

Kudzu - Patient Chart

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mond Mail Sched Help

Rogers, Christy Rene Age 35 Female Caucasian

555 Clinton Dr. (919) 555-6324

Done

General Inquiries Medication History Referrals BSH History

Personal Information

Last Name: Rogers First Name: Christy Middle Name: Kane ☐ Refused Intake

Address: 110 Trackers Rd City: Cary State: NC Zip Code: 27513

Home Phone: 555-2037 Work Phone: (919) 555-3334 Wk Ext: SSN: 238-46-5971

Demographics

Race: Caucasian Gender: Female ☐ ☒

Birth Date: 2/7/58 Height: 5 4 Weight: 125

Preferred Language: English

Kudzu Information

R Kudzu Number: Renewal Date: 12/15/95 Patient ID:

Enter the patient's last name

Testing User #1 01/10/95 02:08 pm

FIGURE 5II

Kudzu - CSR Intake

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mond Mail Sched Help

Request: Encorder Info Pt Summary

Request: Rx Delivery ☒ Waiting ☐ Pickup ☐ Delivery

Current Rx: Rx # Drug New Rx E.M. Renew

Previous Rx: Rx # Drug Renew

Rx # Drug Name:

OTC Consultation Requests

Extended Consultation Requests

Screening/Procedures Requests

☐ Blood Pressure ☐ Pulse Rate ☐ Blood Sugar ☐ Weight ☐ Height

Robert, Cheryl Rose Age 75 Female Evaluation

585 Clarno Dr
(919) 555-6324

Done

Select this if the patient is waiting in the pharmacy

Testing Unit #3 10/10/95 02:03 pm

FIGURE 5JJ

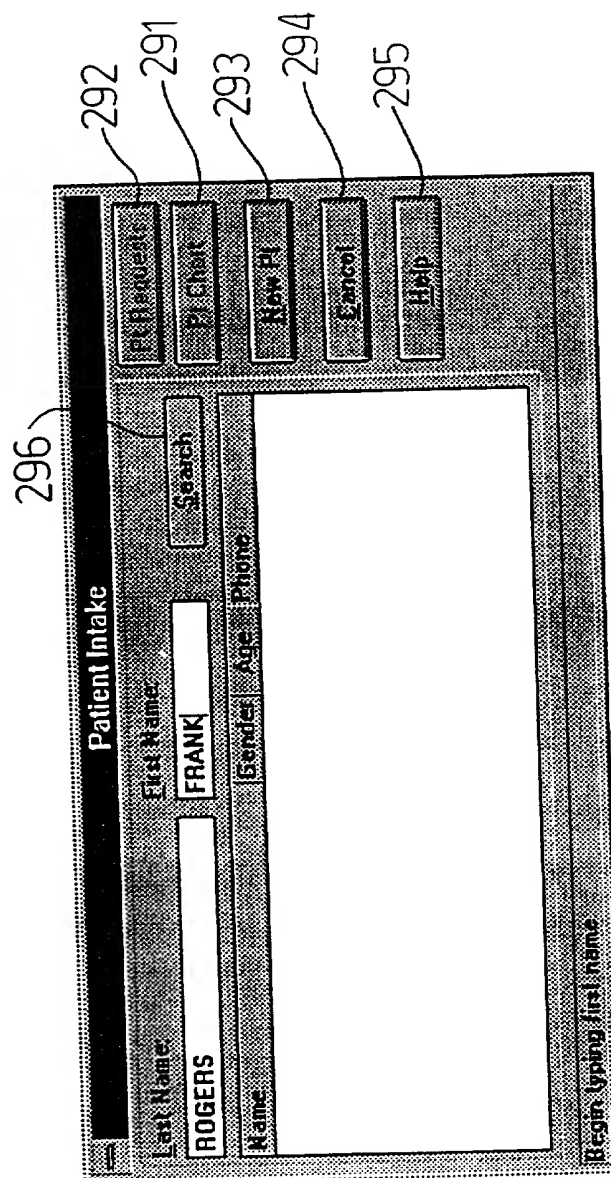


FIGURE 5KK

Kudzu - Patient Chart

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mono Mail Sched Help

Rogers, Frank
655 Clarence Dr.
(913) 635-6324

General Insurance Medical Misc Rx Profile CSR History Done

Personal Information

Last Name: First Name: Middle Name: Refused Intake: ☐

Address: City: State: Zip Code:

Home Phone: Work Phone: WK Ext: SSN:

Demographics

Race: Gender: Height: Weight: Preferred Language:

Birth Date:

Kudzu Information

☐ Kudzu Member

Referral Date: Patient ID:

Select this if the patient is waiting in the pharmacy

Testing User: #1 07/10/95 02:12 pm

FIGURE 5LL

Kudzu - Work Orders

File

Edit

Views

Action

Reports

Utilities

Help

Pt. Refill

WO

PC

CSR

Cog

Cou

Soap

Note

Mon

Sched

Help

Anderson, John B.

Age: 40

Male

Hispans

9608 Elder Rd

9131 555-5223

Find Patient

View

☒ All Orders
 ☐ Cognitive

☐ Dispensing
 ☐ Counseling

All Active Orders

Name	Step	Category	Is	New	Req	Meds	CSR
Waiting Anderson, John B.	S	Counseling	High	1	1	OPC	170 30
Waiting Williams, Peter A.	S	Counseling	Low	3	3		31

Print on existing Rx

Printing User: 11 01/05/96 09:17 am

FIGURE 5MM

Refill Rx

Rx #

Rx Information

This space blank until valid Rx # entered

Refill End Rx Cancel Help

Enter the RX number to be refilled

FIGURE 5NIN

Refill Rx

Rx # 0000004

Rx Information

PANTHEX 500MG CAPS

Quantity: 50 Days: 25 Wellsby, John A. MD

Brown, Candace Ruiton (617) 555-5584

Enter the RX number to be refilled

Refill Edit Rx Cancel Help

FIGURE 500

Kudzu - CSR Intake

File Edit Views Action Reports Utilities Help

Pt. Refill WO PC CSR Cog Cou SoapNote Mond Mail Sched Help

Brown, Candace Burton Age 40 Female American Indian/Alaskan Done

666 Clinton Dr
[919] 555-6324

Requests **Expanded Info** **Previous Rx** **Rx Summary**

Rx Delivery
☒ Waiting ☐ Pickup ☐ Delivery

Current Rx
 Rx # Bug
 0000004 KANTREX 500MG CAPS
 [New Rx] [Edit] [Remove]

Previous Rx
 Rx # Drug
 0000004 KANTREX 500MG
 300
 250
 [Refill]

Drug Name

OTC Consultation Requests

Extended Consultation Requests

Screening/Procedure Requests

☐ Blood Pressure
☐ Pulse Rate
☐ Blood Sugar
☐ Weight
☐ Height

View the current work orders active with the pharmacy

Testing User #1 01/10/95 02:15 pm

FIGURE 5PP

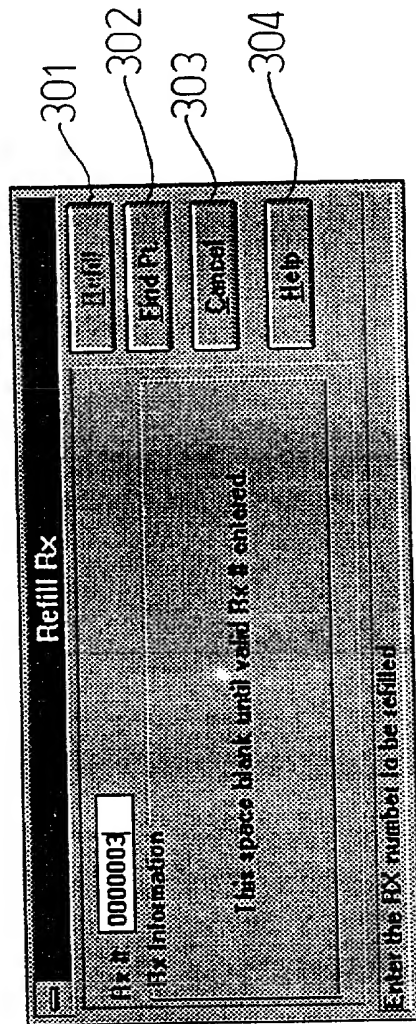


FIGURE 5QQ

Patient Intake

Last Name: First Name:

Name: Gender: Age: Phone:

FIGURE 5RR

53 / 54

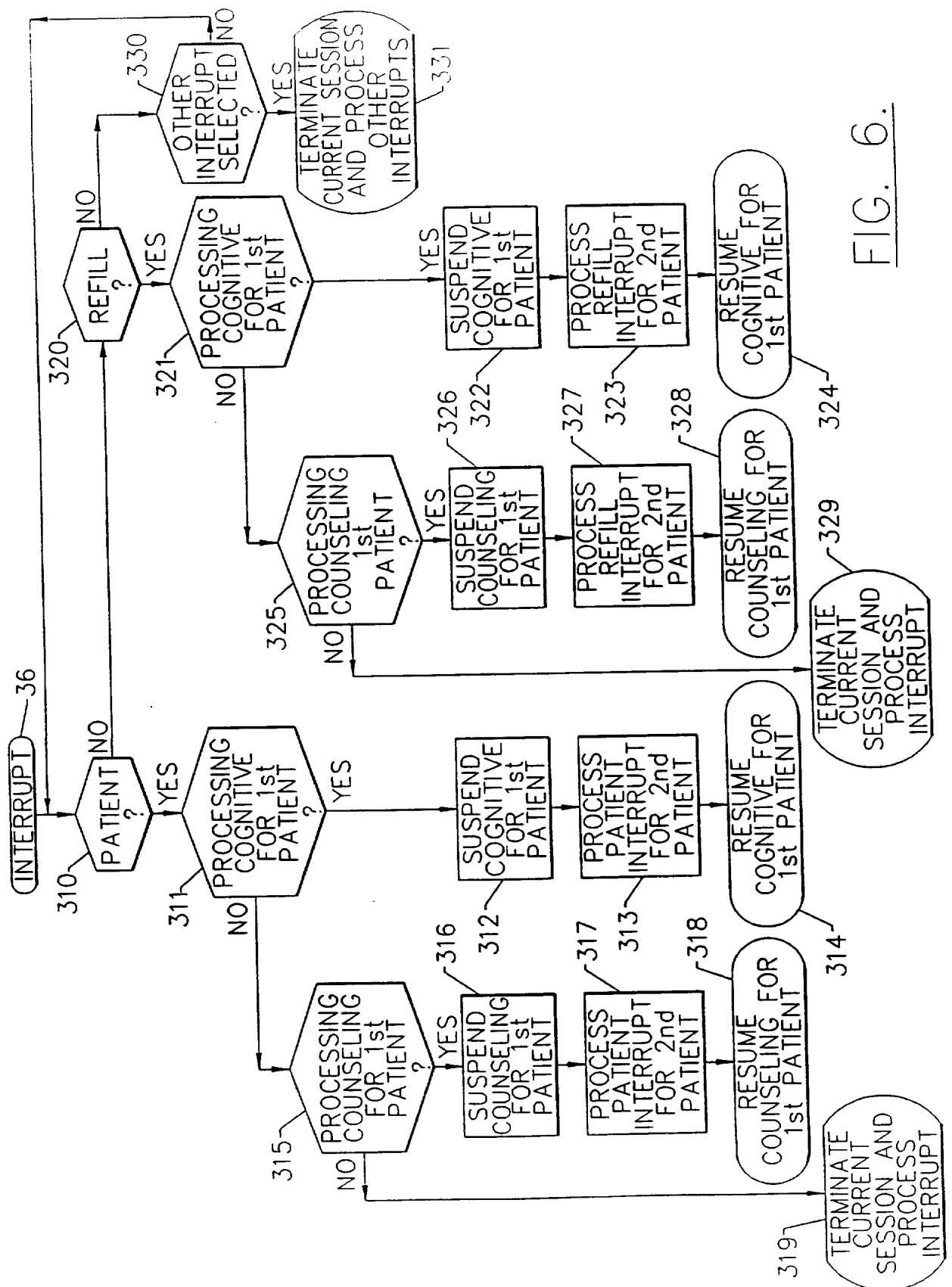


FIG. 6.

54/54

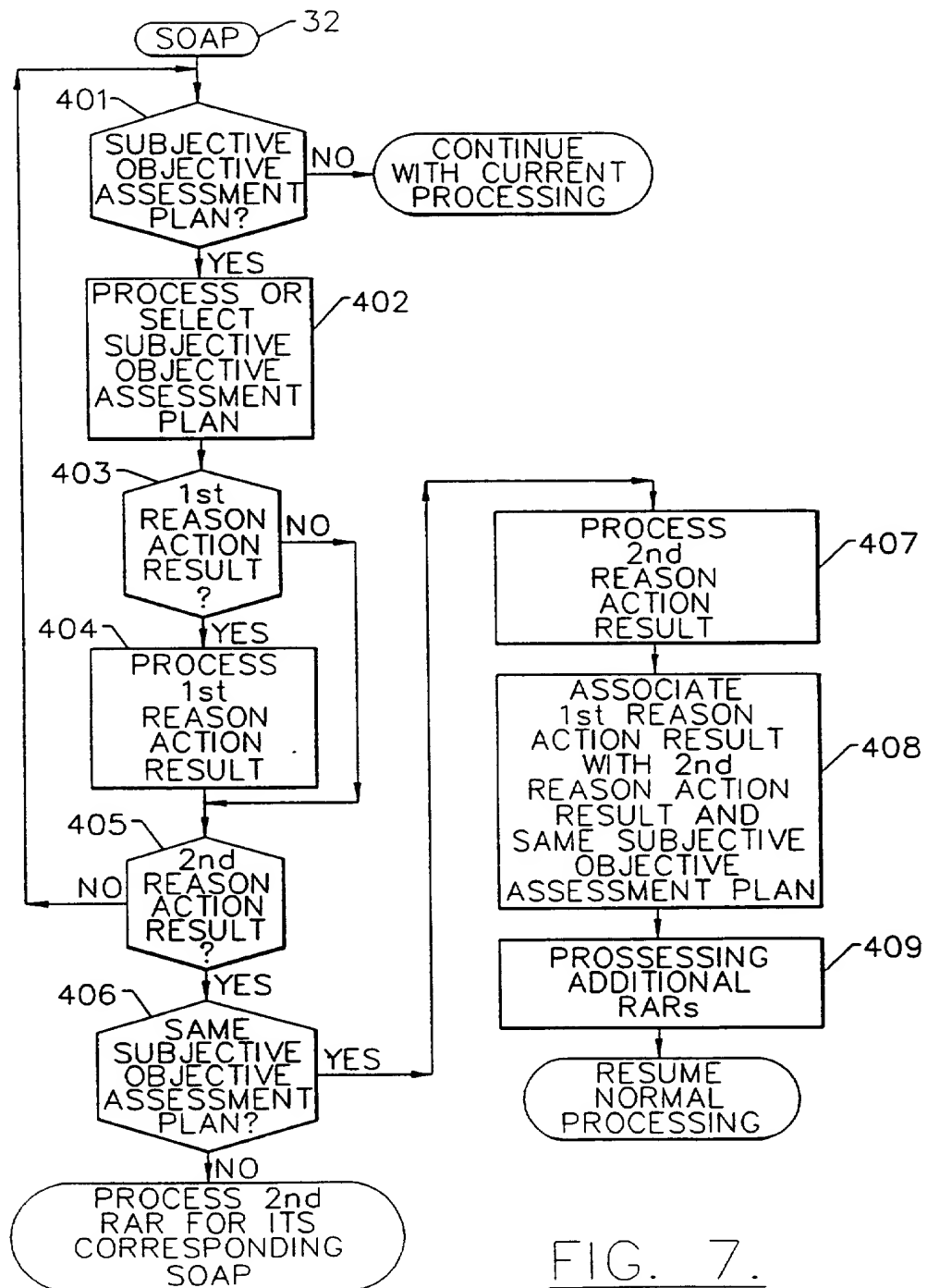


FIG. 7.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/00604**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(6) : G06F 159:00

US CL : 364/401

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 364/401, 395/600, 395/149, 395/157

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
APS, DIALOG**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Pharmaceutical Care Services, Inc., Pharmcare Pharmacist Training Manual, Dana Anderson, Section 9, pp. 1-3.	1-6, 8-22, 24-33
Y	Innovative Practice, American Pharmacy, March 1994, S. Martin, "Pharmaceutical Care Made Easy", pages 61-64	1-6, 8-22, 24-33
Y	US, A, 4,847,764 (HALVORSON) 11 July 1989, col.3, lines 31-34, col. 4, lines 27-31.	7, 23
A	US, A, 5,299,121 (BRILL et al) 29 March, 1994	1-33
A	US, A, 4,546,901 (BUTTARAZZI) 15 October 1985	1-33

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be part of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 08 April 1996	Date of mailing of the international search report 30 APR 1996
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3588	Authorized officer Robert Weinhardt Telephone No. (703) 305-9780

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/00604

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 4,839,806 (GOLDFISCHER et al) 13 July 1989	1-33